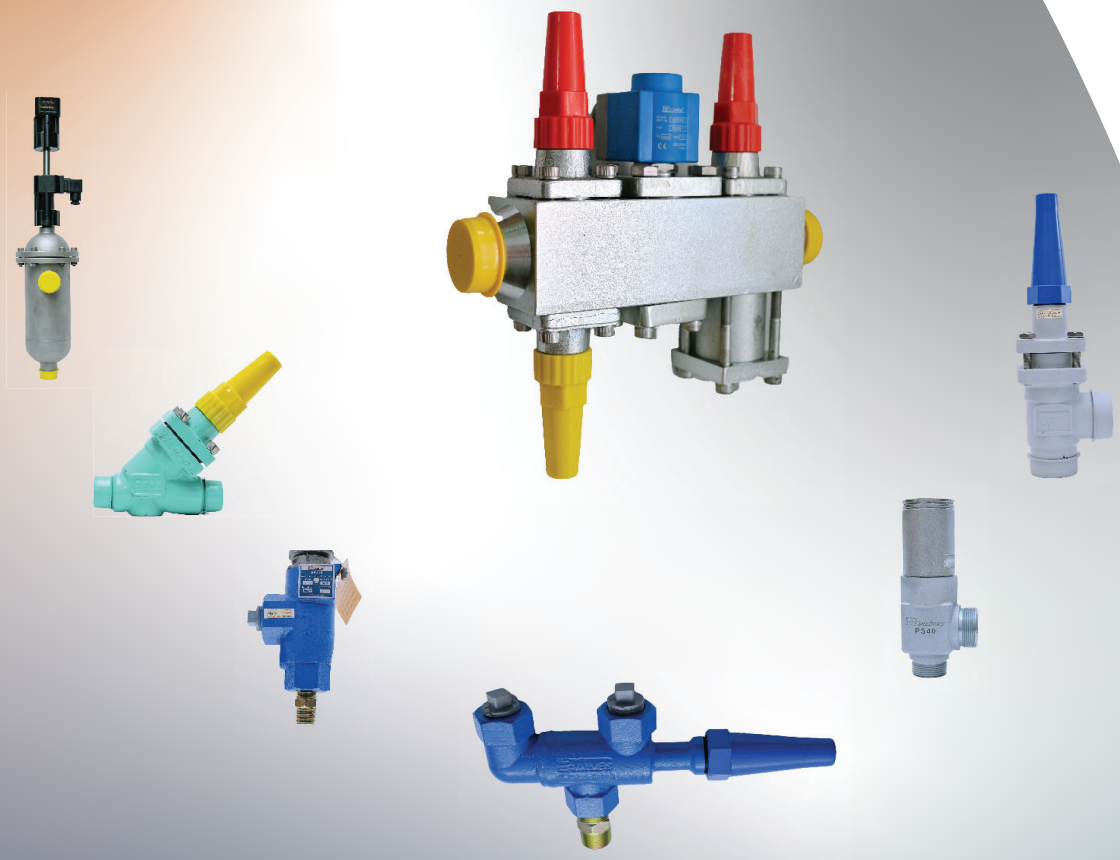
HP - valves®

Refrigeration Valves



Refrigeration Valves

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OUR PRODUCTS

Applied for refrigeration system only.
Maximal working pressure MWP: 52 bar.
Temperature range: -50°C / +150°C.
Refrigerants : HCFC, CFC, R717, R744.

ORDER CODE

CHSA0125

- Connecting size
- Species
- Product code

Shut-off valves, angle

SHUA

DN15 - DN200

P.7

Shut-off valves, straight

SHUS

DN15 - DN200

P.8

Hand regulating valves, angle

HRGA

DN15 - DN32

P.9

Hand regulating valves, straight

HRGS

DN15 - DN32

P.10

Shut-off check valves, angle

CHSA

DN32 - DN150

P.11

Shut-off check valves, straight

CHSS

DN32 - DN150

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Mesh strainers, angle

STRA

DN15 - DN100

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Mesh strainers, straight

STRS

DN15 - DN100

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Lever oil drain valve, angle

HDRA

DN15

P.15

Differential pressure relief valve

DPRL

DN20 - DN25

P.16

Safety pressure relief valves

SRLA0

DN15 - DN25

P.17

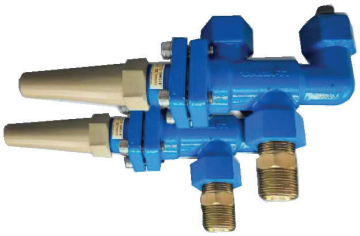
Safety pressure relief valve

SRLA1

DN15 - DN40

P.18

T-way valves

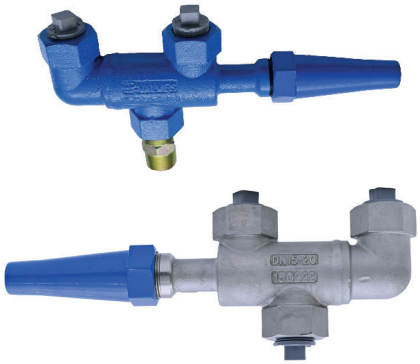


TWAY0

DN15 - DN20

P.19

T-way valves



TWAY1

DN15 - DN20

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Non return valves, straight

CHKS

DN15 - DN100

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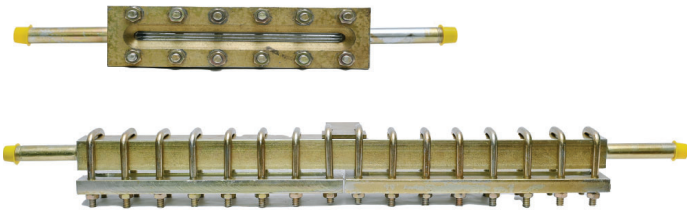
Liquid level sight glasses

LLGB

L280 - L1900



P.22

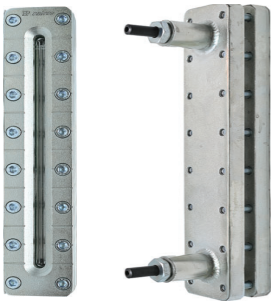
Liquid level sight glasses

LLGV

L280 - L1900

P.23

Liquid level sight glass



LLGS

L400

P.24

Liquid level float switch

LFSW

DN25

P.25

Electronic level sensors

LFSE

DN25

P.26

Service valve

SERA

DN10

P.27

Solenoid valves

SODP

SOPS

DN10 - DN20

DN25

DN32 - DN40

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HP- valves®

Refrigeration Valves

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Solenoid valves, 1-step opened

SO1P

DN25 - DN100

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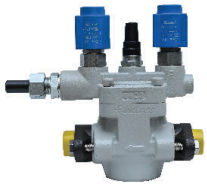
Solenoid valves, 2-step opened

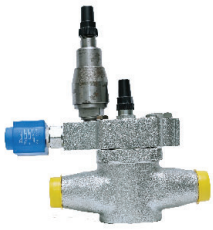
SO2P

DN50 - DN100



P.30

Pilot-operated valves, 3-functional



SO3P

DN25 - DN100

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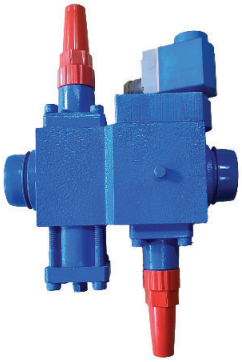
Electronic actuator motor valves

RCMS

DN20 - DN150

P.32

Valve stations



GR4V

DN15 - DN40

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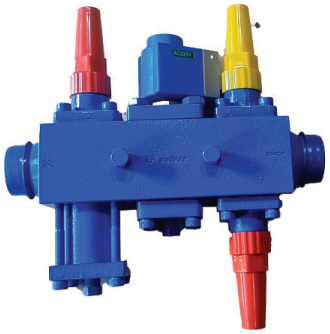
Valve stations



GR6V

DN15 - DN40

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Induction coils & Pilots

PILOTSOL
PILOTCDP
PILOTCOP
PILOTCOT

M24

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Oil drain valve

ODRA

DN20

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Refrigeration Valves

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Refrigeration Valves

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Valve selection

Symbols in the selection tables

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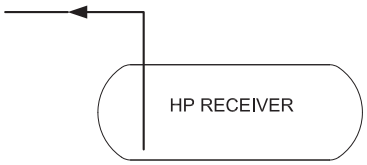
Valve selection

Valves for High pressure liquid line



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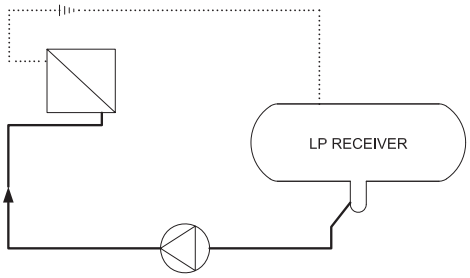
Valve selection

Valves for Pumped circulating liquid line



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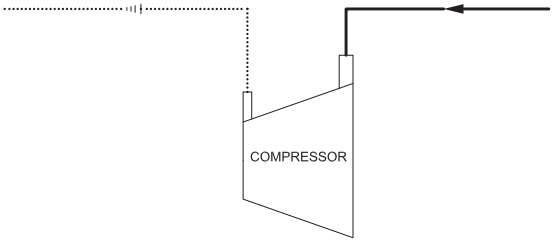
Valve selection

Valves for Suction line



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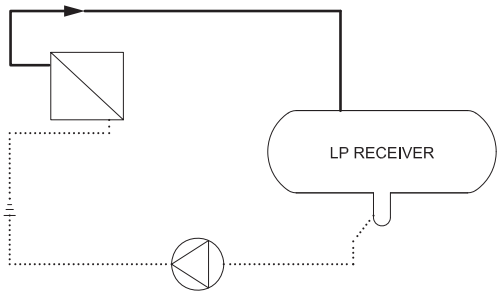
Valve selection

Valves for Pumped circulating suction line



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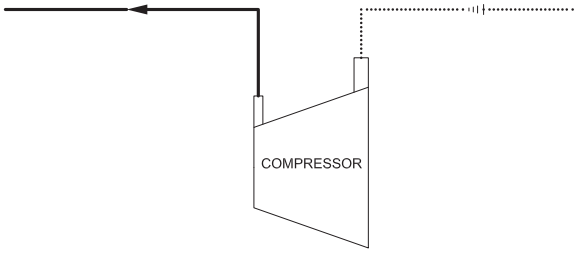
Valve selection

Valves for Discharge line



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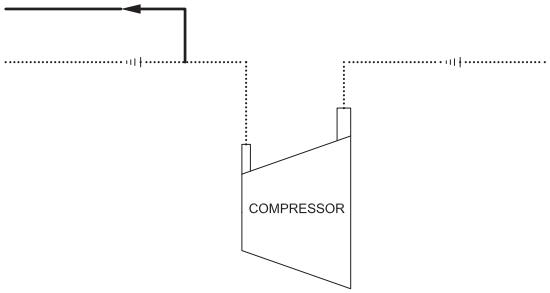
Valve selection

Valves for Hot gas line



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Addendum

Used HP valves in design
of industrial refrigeration

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HP- valves®

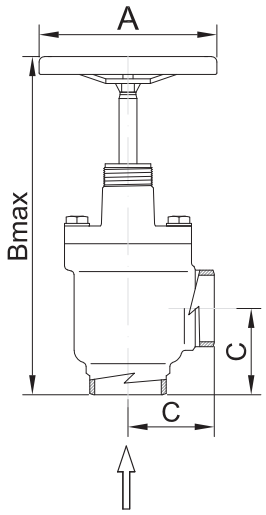
Shut-off valves, angle

SHUA

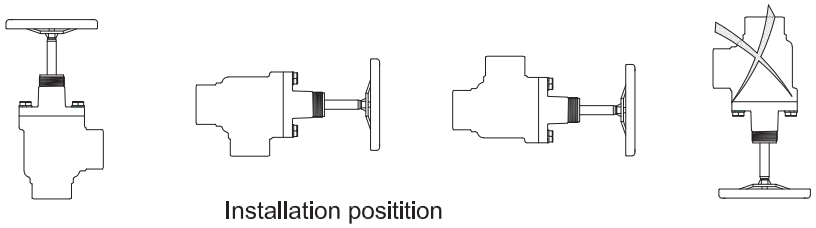
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used in suction, discharge, liquid, hot gas, recirculating liquid and oil lines.*
- *Connecting method: butt weld.*

Installation dimensions

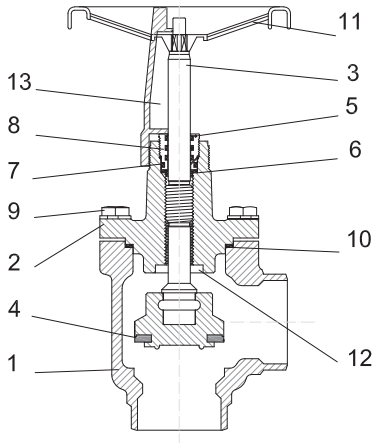


Model	Connection in/out	Dimensions			Weight (kg)	Code
		A	Bmax	C		
SHUA0015	15 mm $\frac{1}{2}$ inch	62	195	41	1.2	0819GO
SHUA0020	20 mm $\frac{3}{4}$ inch	62	195	41	1.2	0819GO
SHUA0025	25 mm *1 inch*	62	220	46	1.8	0819GO
SHUA0032	32 mm *1 $\frac{1}{4}$ inch*	82	250	55	2.8	0919GO
SHUA0040	40 mm *1 $\frac{1}{2}$ inch*	82	250	55	2.8	0820GO
SHUA0050	50 mm *2 inch*	106	250	60	3.0	0820GO
SHUA0065	65 mm *2 $\frac{1}{2}$ inch*	106	272	70	6.0	0321GO
SHUA0080	80 mm *3 inch*	200	337	90	10.0	0221GO
SHUA0100	100 mm *4 inch*	200	380	106	17.5	1120GO
SHUA0125	125 mm *5 inch*	250	480	128	30.0	0422GO
SHUA0150	150 mm *6 inch*	250	564	145	40.5	0522GO
SHUA0200	200 mm *8 inch*	400	677	180	69.6	0623GO



Installation posititon

Construction



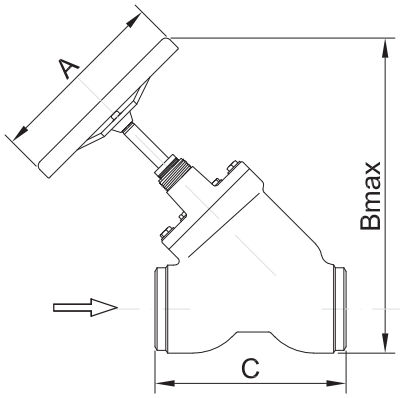
Item	Part	Material	Species
1	Housing	Steel	A352 LCC, S20C
2	Valve bonnet	Steel	S20C
3	Spindle	Stainless steel	AISI 304
4	Cone seal	Teflon (PTFE)	
5	Packing gland	Stainless steel	AISI 304
6	Gasket	Teflon Spring	PTFE
7	Oring	Cloroprene (Neoprene)	
8	Oring	Cloroprene (Neoprene)	
9	Bolts	Stainless steel	AISI 304
10	Gasket	Teflon / Fiber non-amiang	
11	Hand wheel	Stainless steel	AISI 304
12	Gasket	Aluminium	
13	Cap	Aluminium / Plastic	Alu or ABS

Van chặn thẳng *Shut-off valves, straight* SHUS

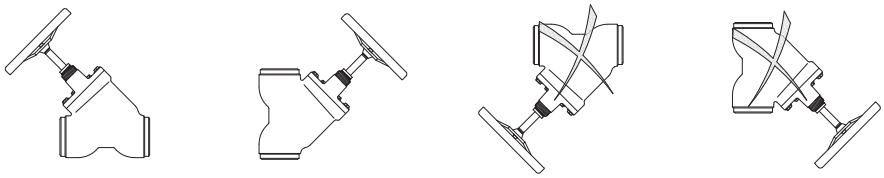
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used in suction, discharge, liquid, hot gas, recirculating liquid and oil lines.*
- *Connecting method: butt weld.*

Installation dimensions

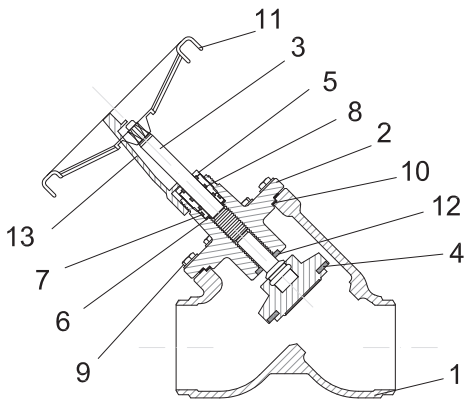


Model	Connection in/out	Dimensions			Weight (kg)	Code
		A	Bmax	C		
SHUS0015	15 mm $\frac{1}{2}$ inch	62	205	110	1.5	0819TH
SHUS0020	20 mm $\frac{3}{4}$ inch	62	205	110	1.5	0819TH
SHUS0025	25 mm *1 inch*	62	230	127	2.0	0819TH
SHUS0032	32 mm *1 $\frac{1}{4}$ inch*	82	270	145	3.0	0919TH
SHUS0040	40 mm *1 $\frac{1}{2}$ inch*	82	270	145	3.0	0820TH
SHUS0050	50 mm *2 inch*	106	300	148	4.0	0820TH
SHUS0065	65 mm *2 $\frac{1}{2}$ inch*	106	320	187	7.5	0321TH
SHUS0080	80 mm *3 inch*	200	383	215	12.5	0221TH
SHUS0100	100 mm *4 inch*	200	465	270	20.0	1120TH
SHUS0125	125 mm *5 inch*	250	570	323	35.0	0422TH
SHUS0150	150 mm *6 inch*	250	594	370	47.5	0923TH
SHUS0200	200 mm *8 inch*	400	726	464	75.6	1123TH



Installation posititon

Construction



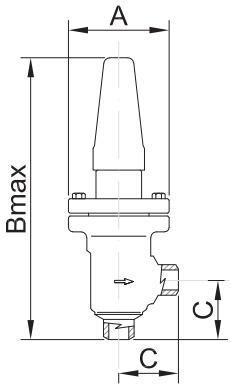
Item	Part	Material	Species
1	Housing	Steel	A352 LCC, S20C
		Stainless steel	AISI 304
2	Valve bonnet	Steel	S20C
3	Spindle	Stainless steel	AISI 304
4	Cone seal	Teflon (PTFE)	
5	Packing gland	Stainless steel	AISI 304
6	Gasket	Teflon Spring	PTFE
7	Oring	Cloroprene (Neoprene)	
8	Oring	Cloroprene (Neoprene)	
9	Bolts	Stainless steel	AISI 304
10	Gasket	Teflon / Fiber non-amiang	
11	Hand wheel	Stainless steel	AISI 304
12	Gasket	Aluminium	
13	Cap	Aluminium / Plastic	Alu or ABS

Hand regulating valves, angle HRGA

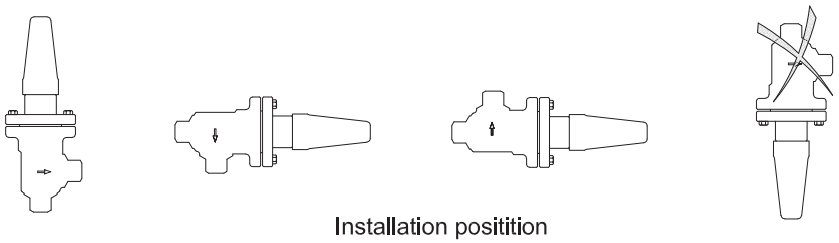
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for regulation or expansion of liquid refrigerants.*
- *Used in liquid supply, pumped recirculating liquid lines.*
- *Connecting method: butt weld.*

Installation dimensions

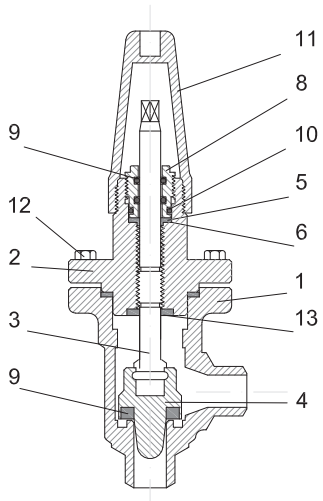


Model		Connection in/out	Dimensions			Weight (kg)
Expansion	Regulating		A	Bmax	C	
HRGA0015	HRGA1015	15 mm $\frac{1}{2}$ inch	54	195	41	1.8
HRGA0020	HRGA1020	20 mm $\frac{3}{4}$ inch	54	195	41	1.8
HRGA0025	HRGA1025	25 mm 1 inch	58	220	46	2.5
HRGA0032	HRGA1032	32 mm 1 $\frac{1}{4}$ inch	71	250	55	3.5



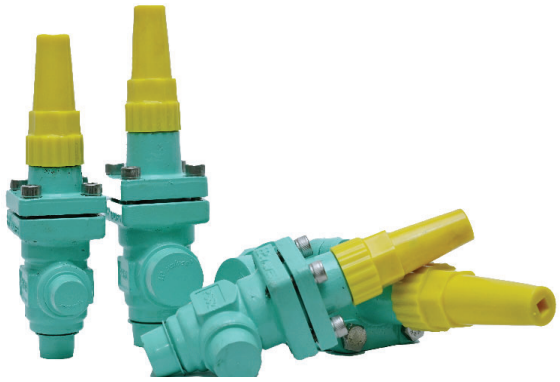
Installation posititon

Construction



Item	Part	Material	Species
1	Housing	Steel	A352 LCC, S20C
		Stainless steel	AISI 304
2	Valve bonnet	Steel	S20C
3	Spindle	Stainless steel	AISI 304
4	Cone seal	Teflon (PTFE)	
5	Gasket	Teflon-Fiber non-amiang	
6	Gasket	Teflon Spring	PTFE
7	Gasket	Teflon (PTFE)	
8	Packing gland	Stainless steel	AISI 304
9	Oring	Cloroprene (Neoprene)	
10	Oring	Cloroprene (Neoprene)	
11	Seal Cap	Aluminium or Plastic	Alu or ABS
12	Bolts	Inox *Stainless steel*	AISI 304
13	Gasket	Aluminium	

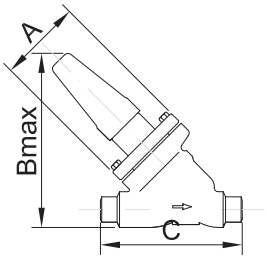
Hand regulating valves, straight — HRGS



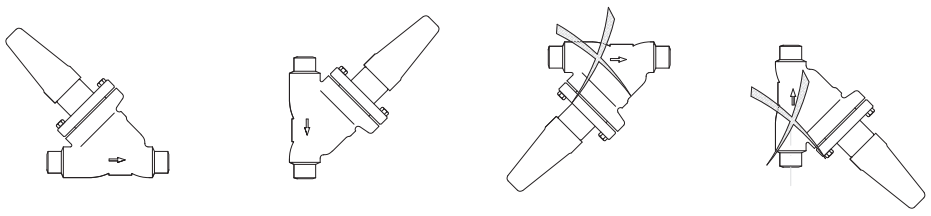
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for regulation or expansion of liquid refrigerants.*
- *Used in liquid supply, pumped recirculating liquid lines.*
- *Connecting method: butt weld.*

Installation dimensions

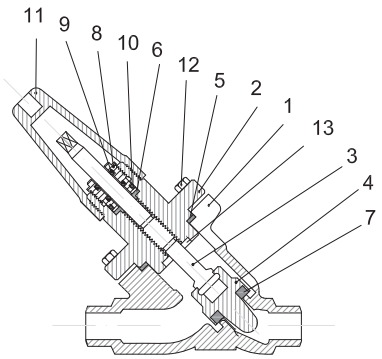


Model		Connection in/out	Dimensions			Weight (kg)
Expasion	Regulating		A	Bmax	C	
HRGS0015	HRGS1015	15 mm $\frac{1}{2}$ inch	54	205	110	2.1
HRGS0020	HRGS1020	20 mm $\frac{3}{4}$ inch	54	205	110	2.1
HRGS0025	HRGS1025	25 mm *1 inch*	58	230	127	2.8
HRGS0032	HRGS1032	32 mm *1 $\frac{1}{4}$ inch*	71	270	145	3.8



Installation posititon

Construction



Item	Part	Material	Species
1	Housing	Steel	A352 LCC, S20C
		Stainless steel	AISI 304
2	Valve bonnet	Steel	S20C
3	Spindle	Stainless steel	AISI 304
4	Cone seal	Teflon (PTFE)	
5	Gasket	Teflon-Fiber non-amiang	
6	Gasket	Teflon Spring	PTFE
7	Gasket	Teflon (PTFE)	
8	Packing gland	Stainless steel	AISI 304
9	Oring	Cloroprene (Neoprene)	
10	Oring	Cloroprene (Neoprene)	
11	Seal Cap	Aluminium or Plastic	Alu or ABS
12	Bolts	Inox *Stainless steel*	AISI 304
13	Gasket	Aluminium	

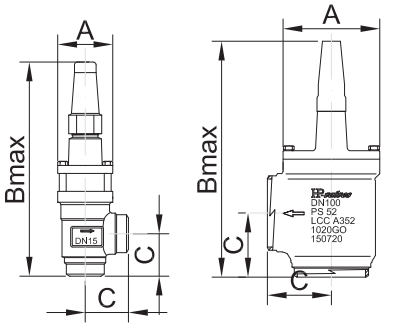
Shut-off check valves, angle CHSA

Recommendations

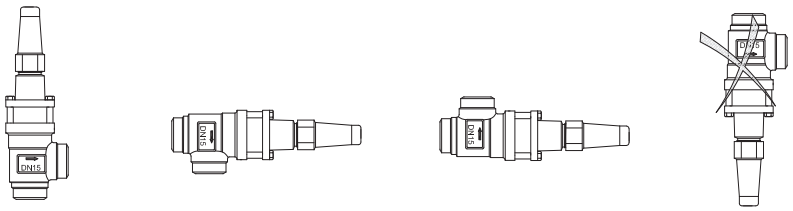
- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for control the flow of refrigerants in one direction.*
- *Used in discharge, liquid supply, pumped recirculating liquid lines.*
- *Connecting method: butt weld.*

Installation dimensions

CHSA0032-0040 CHSA0050-0150

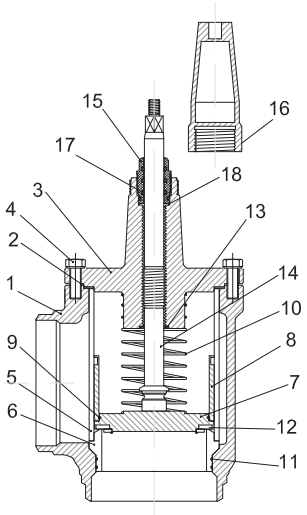


Model	Connection in/out	Dimensions			Weight (kg)
		A	Bmax	C	
CHSA0032	32 mm 1 1/4 inch	71	280	55	3.2
CHSA0040	40 mm 1 1/2 inch	71	280	55	3.2
CHSA0050	50 mm 2 inch	78	240	60	4.0
CHSA0065	65 mm 2 1/2 inch	100	272	70	7.0
CHSA0080	80 mm 3 inch	133	337	90	11.0
CHSA0100	100 mm 4 inch	160	380	106	16.0
CHSA0125	125 mm 5 inch	193	480	128	28.0
CHSA0150	150 mm 6 inch	219	564	145	38.0



Installation posititon

Construction



Item	Part	Material	Species
1	Housing	Steel	A352 LCC
2	Cone seal	Teflon - Fiber non amiang	
3	Valve bonnet	Steel	S20C
4	Bolts	Stainless steel	AISI 304
5	Tube	Steel	
6	Valve seat	Steel	
7	Valve plate	Steel	
8	Guide sleeve	Steel	
9	Spring ring	Steel	
10	Spring	Steel	
11	Oring	Cloroprene (Neoprene)	
12	Teflon ring	Teflon (PTFE)	
13	Soft back seal	Teflon (PTFE)	
14	Spindle	Stainless steel	AISI 304
15	Packing gland	Stainless steel	AISI 304
16	Hand wheel	Aluminium or Plastic	Alu or ABS
17	Oring	Cloroprene (Neoprene)	
18	Gasket	Teflon Spring	PTFE

Shut-off check valves, straight

CHSS

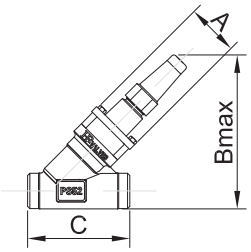
Recommendations

- Maximal working pressure MWP: 52 bar
- Temperature range: -50°C / +150°C
- Refrigerants : HCFC, CFC, R717, R744

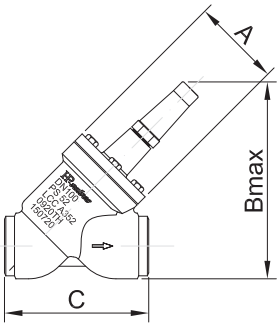
- Used for control the flow of refrigerants in one direction.
- Used in discharge, liquid supply, pumped recirculating liquid lines.
- Connecting method: butt weld.

Installation dimensions

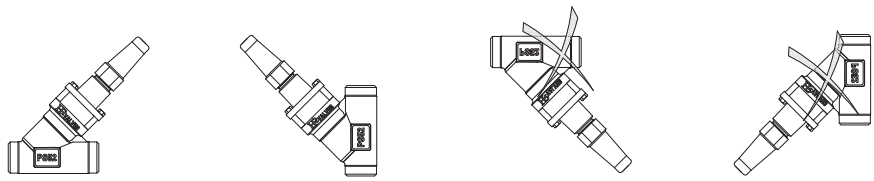
CHSS0032-0040



CHSS0050-0150

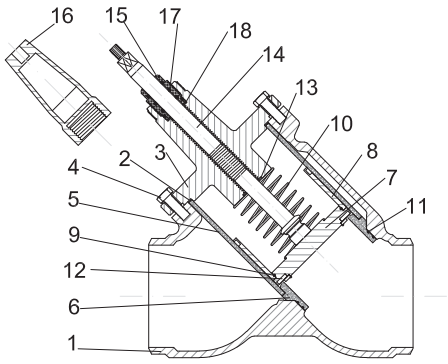


Model	Connection in/out	Dimensions			Weight (kg)
		A	Bmax	C	
CHSS0032	32 mm 1 1/4 inch	71	270	145	3.5
CHSS0040	40 mm 1 1/2 inch	71	270	145	3.5
CHSS0050	50 mm 2 inch	78	300	148	5.0
CHSS0065	65 mm 2 1/2 inch	100	320	187	8.5
CHSS0080	80 mm 3 inch	133	383	215	13.5
CHSS0100	100 mm 4 inch	160	465	270	18.5
CHSS0125	125 mm 5 inch	193	570	323	33.0
CHSS0150	150 mm 6 inch	219	594	370	45.0



Installation posititon

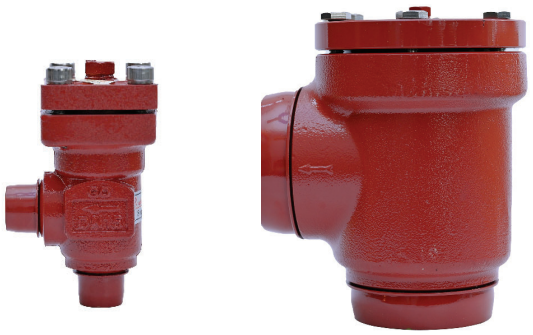
Construction



Item	Part	Material	Species
1	Housing	Steel	A352 LCC
2	Cone seal	Teflon - Fiber non amiang	
3	Valve bonnet	Steel	S20C
4	Bolts	Stainless steel	AISI 304
5	Tube	Steel	
6	Valve seat	Steel	
7	Valve plate	Steel	
8	Guide sleeve	Steel	
9	Spring ring	Steel	
10	Spring	Steel	
11	Oring	Cloroprene (Neoprene)	
12	Teflon ring	Teflon (PTFE)	
13	Soft back seal	Teflon (PTFE)	
14	Spindle	Stainless steel	AISI 304
15	Packing gland	Stainless steel	AISI 304
16	Hand wheel	Aluminium or Plastic	Alu or ABS
17	Oring	Cloroprene (Neoprene)	
18	Gasket	Teflon Spring	PTFE

Mesh strainer, angle

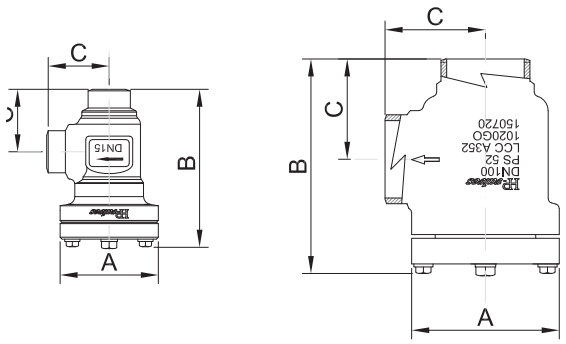
STRA



Recommendations

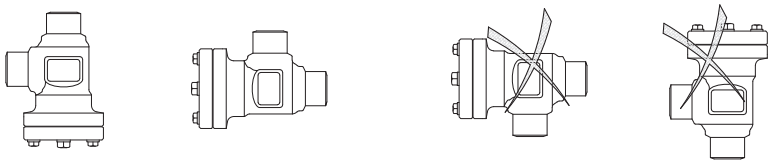
- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for removal of dust, welding cinder or foreign from refrigeration system.*
- *Used in suction, liquid supply, pumped recirculating liquid lines and before solenoid and pilot-operated valve.*
- *Connecting method: butt weld.*

Installation dimensions



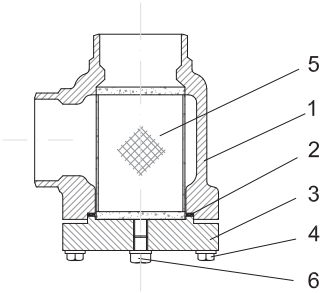
Model	Connection in/out	Dimensions			Weight (kg)
		A	Bmax	C	
STRA...015	15 mm $\frac{1}{2}$ inch	54	92	41	1.1
STRA...020	20 mm $\frac{3}{4}$ inch	54	92	41	1.1
STRA...025	25 mm *1 inch*	58	112	46	1.6
STRA...032	32 mm *1 $\frac{1}{4}$ inch*	71	121	55	2.2
STRA...040	40 mm *1 $\frac{1}{2}$ inch*	71	121	55	2.3
STRA...050	50 mm *2 inch*	78	134	60	3.0
STRA...065	65 mm *2 $\frac{1}{2}$ inch*	100	154	70	4.5
STRA...080	80 mm *3 inch*	133	177	90	8.5
STRA...100	100 mm *4 inch*	160	208	106	14.0

STRA1032 : 100µm - in front of electronic regulation valve
STRA2032 : 150µm - suction line of reciprocating compressor, protection of automatic regulation equipment
STRA3032 : 250µm - protection of sensitive equipment, suction line of screw compressor
STRA4032 : 500µm - ahead of liquip recirculation pump.



Installation posititon

Construction



Item	Part	Material	Species
1	Housing	Steel	A352 LCC, S20C
		Stainless steel	AISI 304
2	Gasket	Fiber non-amiang	
3	Cover	Steel	SS400
4	Bolts	Stainless steel	
5	Filter	Stainless steel	AISI 304
6	Pressure relief screw	Steel	

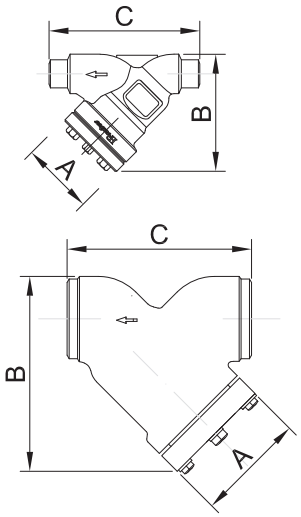
Mesh strainer, straight

STRS

Recommendations

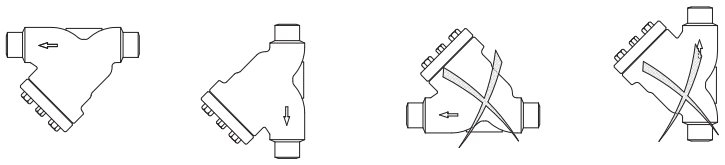
- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for removal of dust, welding cinder or foreign from refrigeration system.*
- *Used in suction, liquid supply, pumped recirculating liquid lines and before solenoid and pilot-operated valve.*
- *Connecting method: butt weld.*

Installation dimensions



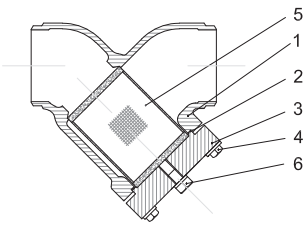
Model	Connection in/out	Dimensions			Weight (kg)
		A	Bmax	C	
STRS...015	15 mm $\frac{1}{2}$ inch	54	99	110	1.2
STRS...020	20 mm $\frac{3}{4}$ inch	54	99	110	1.2
STRS...025	25 mm *1 inch*	58	110	127	1.8
STRS...032	32 mm *1 $\frac{1}{4}$ inch*	71	129	145	2.8
STRS...040	40 mm *1 $\frac{1}{2}$ inch*	71	129	145	2.8
STRS...050	50 mm *2 inch*	78	138	148	4.0
STRS...065	65 mm *2 $\frac{1}{2}$ inch*	100	165	187	6.0
STRS...080	80 mm *3 inch*	133	204	215	10.0
STRS...100	100 mm *4 inch*	160	256	270	16.0

STRS1032 : 100µm - in front of electronic regulation valve
STRS2032 : 150µm - suction line of reciprocating compressor, protection of automatic regulation equipment
STRS3032 : 250µm - protection of sensitive equipment,



Installation posititon

Construction



Item	Part	Material	Species
1	Housing	Steel	A352 LCC, S20C
		Stainless steel	AISI 304
2	Gasket	Fiber non-amiang	
3	Cover	Steel	SS400
4	Bolts	Stainless steel	
5	Filter	Stainless steel	AISI 304
6	Pressure relief screw	Steel	

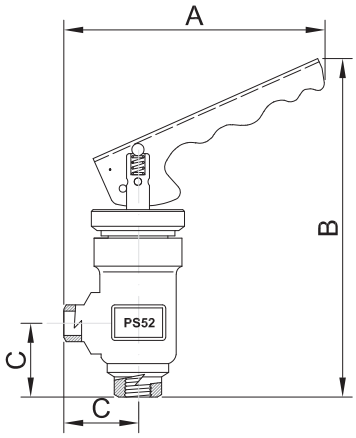
Lever oil drain valve, angle

HDRA

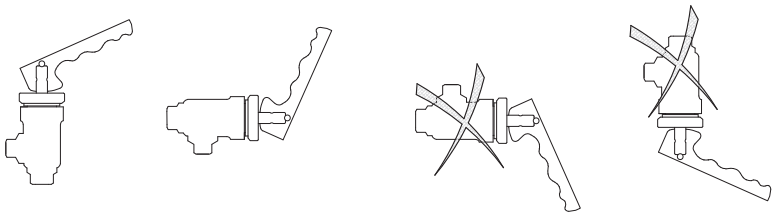
Recommendations

- Maximal working pressure MWP: 52 bar
- Temperature range: -50°C / +150°C
- Refrigerants : HCFC, CFC, R717, R744
- Used for draining of oil from refrigeration system.
- Connecting method: butt weld and inside pipe threaded.

Installation dimensions

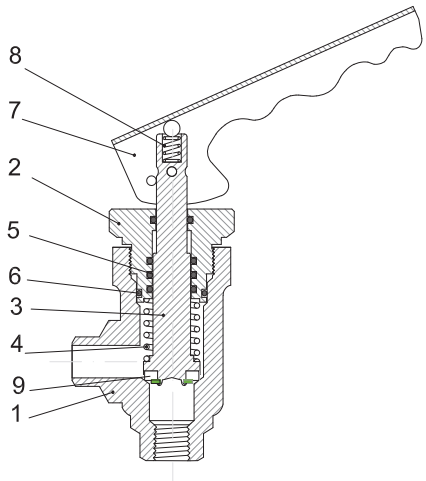


Model	Connection in/out	Dimensions			Weight (kg)
		A	Bmax	C	
HDRA0015	15 mm $\frac{1}{2}$ inch	147	196	42	1.2



Installation posititon

Construction



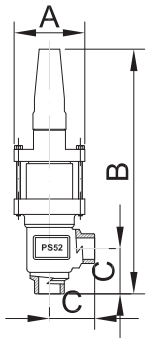
Item	Part	Material	Species
1	Housing	Steel	A352 LCC
		Stainless steel	AISI 304
2	Bonnet	Stainless steel	AISI 304
3	Spindle	Stainless steel	AISI 304
4	Spring	Steel	
5	Oring	Cloroprene (Neoprene)	
6	Oring	Cloroprene (Neoprene)	
7	Handle	Stainless steel	AISI 304
8	Spring	Steel	
9	Cone seal	Teflon (PTFE)	

Differential pressure relief valve DPRL

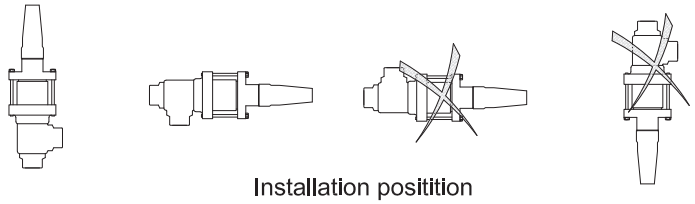
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for release the adjustable overpressure difference. The valve has the function of over flow, non-return and shut-off.*
- *Used in liquid and vapor lines. For example in liquid supply line after liquid pump or overflow drain line of hot gas defrost...*
- *Connecting method: butt weld.*

Installation dimensions

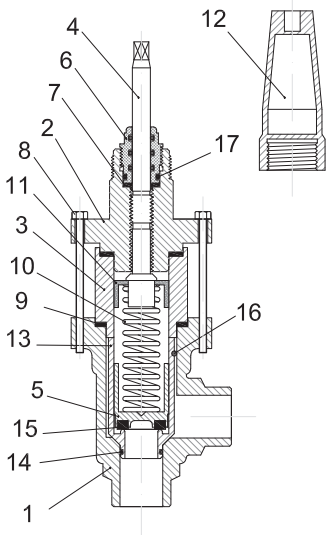


Connection in/out	Dimensions			Weight (kg)
	A	Bmax	C	
20 mm $\frac{3}{4}$ inch	54	230	41	1.7
25 mm 1 inch	54	230	41	1.8



Installation posititon

Construction



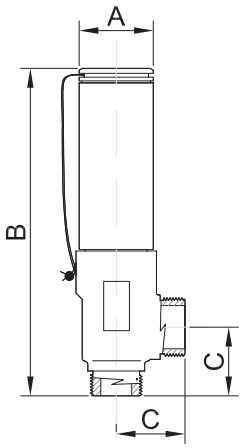
Item	Part	Material	Species
1	Housing	Steel	S20C
2	Valves bonnet	Steel	S20C
3	Positioning tube	Steel	S20C
4	Spindle	Stainless steel	AISI 304
5	Seat	Steel	S20C
6	Packing gland	Stainless steel	AISI 304
7	Gasket	Teflon Spring	PTFE
8	Bolts	Stainless steel	AISI 304
9	Gasket	Teflon,Fiber non-amiang	
10	Spring	Steel	S20C
11	Spring washer	Steel	S20C
12	Cap	Aluminium or Plastic	Alu or ABS
13	Guide Sleeve	Stainless steel	AISI 304
14	Oring	Cloroprene (Neoprene)	
15	Oring	Cloroprene (Neoprene)	
16	Positioning marbles	Stainless steel	AISI 304
17	Oring	Cloroprene (Neoprene)	

Safety pressure relief valve SRLA0

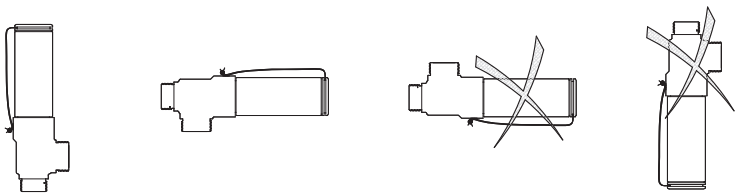
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for protection of the pressure of pressure vessels or piping system from excessive pressure.*
- *Used in gas lines or at vapor part of pressure vessels.*
- *Connecting method: outside pipe threaded.*

Installation dimensions

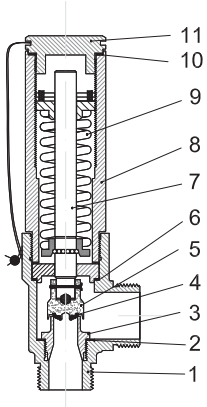


Model	Thread connection (NPT)		Dimensions			Weight (kg)
	Bottom inlet	Side outlet	A	B	C	
SRLA0015	$\frac{1}{2}$ inch	$\frac{3}{4}$ inch	49	210	45	1.8
SRLA0020	$\frac{3}{4}$ inch	1 inch	60	255	55	3.9
SRLA0025	1 inch	1 $\frac{1}{4}$ inch	60	255	55	3.9



Installation posititon

Construction



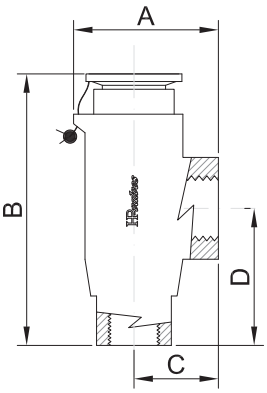
Item	Part	Material	Species
1	Housing	Steel	GJS-400-18-LT
2	Gasket	Aluminium	
3	Valve seat	Stainless steel	AISI 304
4	Valve cone seal	Cloroprene (Neoprene)	
5	Valve Cone	Steel	
6	Gasket	Aluminium	
7	Valve spindle	Stainless steel	AISI 304
8	Valve body	Steel	Sch 40
9	Spring	Steel	
10	Gasket	Aluminium	
11	Plug	Steel	

Safety pressure relief valve SRLA1

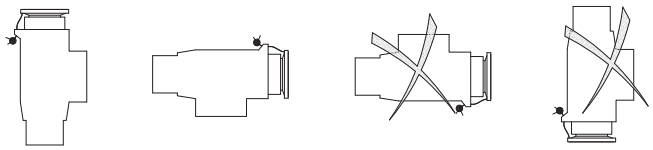
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for protection of the pressure of pressure vessels or piping system from excessive pressure.*
- *Used in gas lines or at vapor part of pressure vessels.*
- *Connecting method: inside pipe threaded.*

Installation dimensions

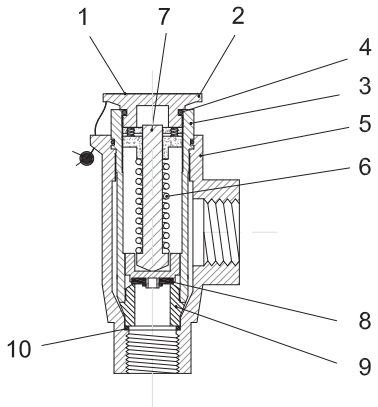


Model	Thread connection (NPT)		Dimensions				Weight (kg)
	Bottom inlet	Side outlet	A	B	C	D	
SRLA1015	$\frac{1}{2}$ inch	$\frac{3}{4}$ inch	70	145	44	75	2.0
SRLA1020	$\frac{3}{4}$ inch	1 inch	70	145	44	75	2.0
SRLA1025	1 inch	$1\frac{1}{2}$ inch	95	180	60	95	3.35
SRLA1032	$1\frac{1}{2}$ inch	$1\frac{1}{2}$ inch	95	180	60	95	3.35



Installation posititon

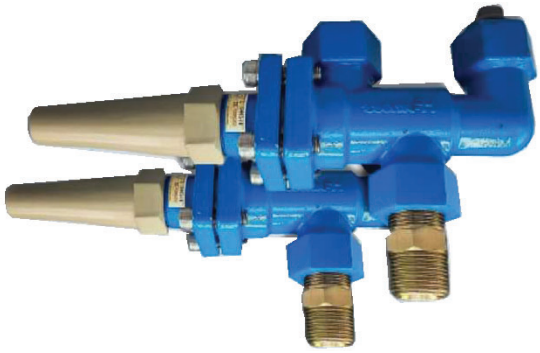
Construction



Item	Part	Material	Species
1	Name plate	Stainless steel	AISI 304
2	Cap	Stainless steel	AISI 304
3	Inner Body	Stainless steel	AISI 304
4	Oring	Cloroprene (Neoprene)	
5	Main Body	Cast - iron	
6	Spring	Steel	
7	Spindle	Stainless steel	AISI 304
8	Plug	Teflon (PTFE)	
9	Seat	Stainless steel	AISI 304
10	Gasket	Aluminium	

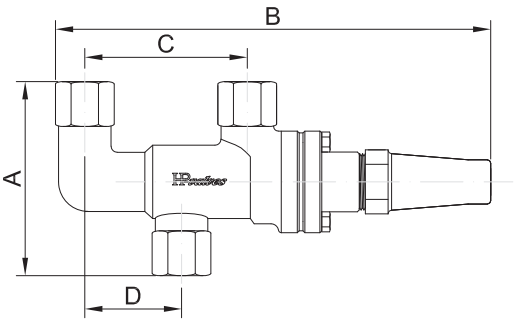
T-way valve

TWAY0



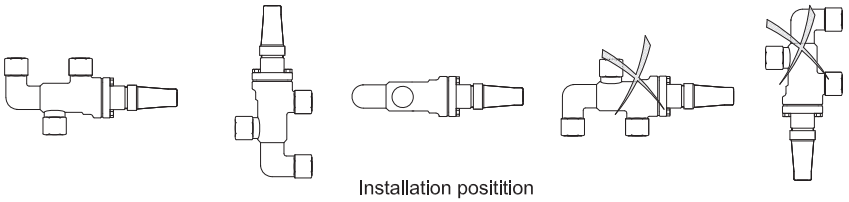
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *T-way is shut-off valve with 2 outputs - one open and the other closed or both outputs open - Used for installation of 2 safety valves.*
- *T-way is installed in pressure vessels with volume greater than 285lts and in vapor part of vessel. T-way also installed for other refrigeration system components, which required always one safety valve permanent.*
- *Connecting method: inside pipe threaded.*



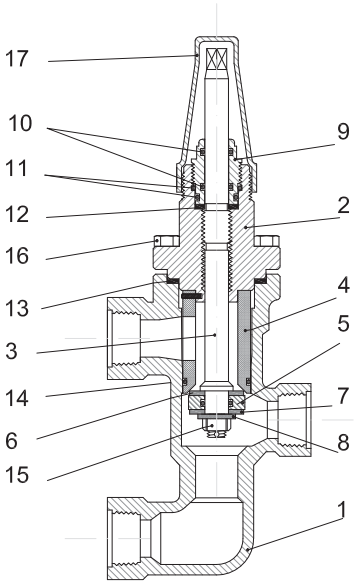
Installation dimensions

Model	Connection in/out	Dimensions				Weight (kg)
		A	B	C	D	
TWAY0015	15 mm $\frac{1}{2}$ inch	98	237	79.5	45	2.8
TWAY0020	20 mm $\frac{3}{4}$ inch	98	237	79.5	45	2.8



Installation posittion

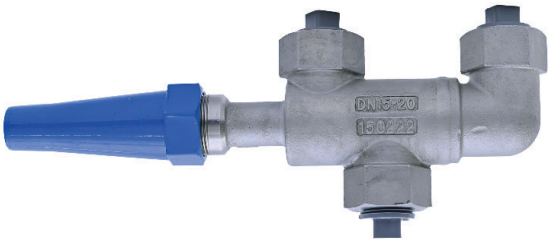
Construction



Item	Part	Material	Species
1	Housing	Steel	A352 LCC
2	Bonnet	Steel	S20C
3	Spindle	Stainless steel	AISI 304
4	Seat	Steel	
5	Cone , middle	Steel	
6	Cone , back	Teflon (PTFE)	
7	Cone , front	Teflon (PTFE)	
8	Cone	Steel	
9	Packing gland	Stainless steel	AISI 304
10	Oring	Cloroprene (Neoprene)	
11	Oring	Cloroprene (Neoprene)	
12	Gasket	Teflon (PTFE)	PTFE
13	Gasket	Non-amiang	
14	Oring	Cloroprene (Neoprene)	
15	Slotted nut	Steel	
16	Bolts	Stainless steel	AISI 304
17	Cap	Aluminium or BSK	Alu or ABS

T-way valve

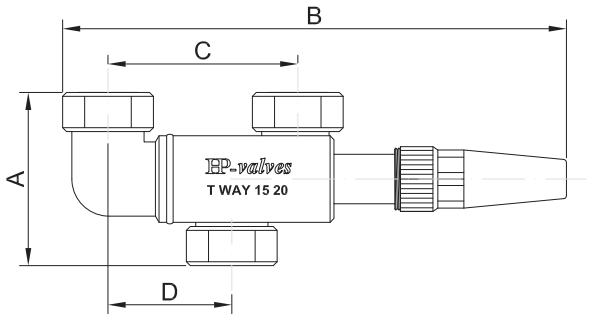
TWAY1



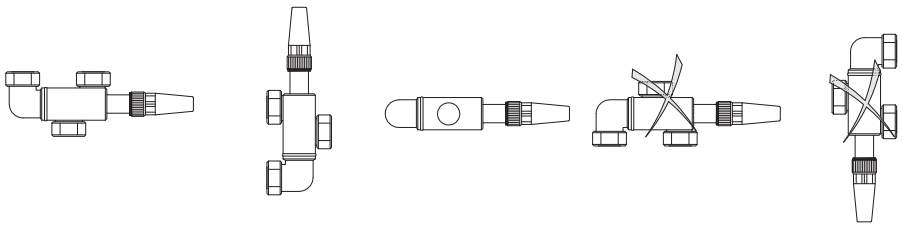
Recommendations

- Maximal working pressure MWP: 52 bar
- Temperature range: -50°C / +150°C
- Refrigerants : HCFC, CFC, R717, R744
- T-way is shut-off valve with 2 outputs - one open and the other closed or both outputs open - Used for installation of 2 safety valves.
- T-way is installed in pressure vessels with volume greater than 285lts and in vapor part of vessel. T-way also installed for other refrigeration system components, which required always one safety valve permanent.
- Connecting method: inside pipe threaded.

Installation dimensions

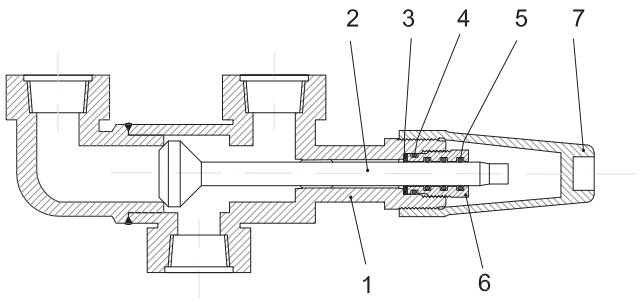


Model	Connection in/out	Dimensions				Weight (kg)
		A	B	C	D	
TWAY1015	15 mm $\frac{1}{2}$ inch	84	242	92	60	2.8
TWAY1020	20 mm $\frac{3}{4}$ inch	84	242	92	60	2.8



Installation positition

Construction



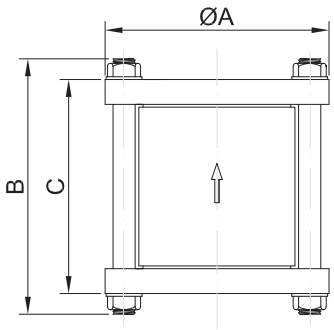
Item	Part	Material	Species
1	Housing	Steel	A352 LCC
2	Spindle	Stainless steel	AISI 304
3	Gasket	Teflon (PTFE)	
4	Oring	Cloroprene (Neoprene)	
5	Oring	Cloroprene (Neoprene)	
6	Packing gland	Stainless steel	AISI 304
7	Cap	Aluminium or Plastic	Alu or ABS

Non return valve, straight — CHKS

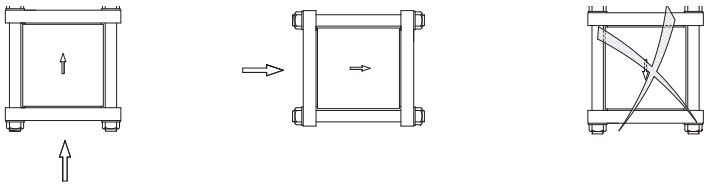
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for control the flow of refrigerants in one direction.*
- *Used in gas, liquid supply, pumped recirculating liquid lines.*
- *Connecting method: butt or socket weld.*

Installation dimensions

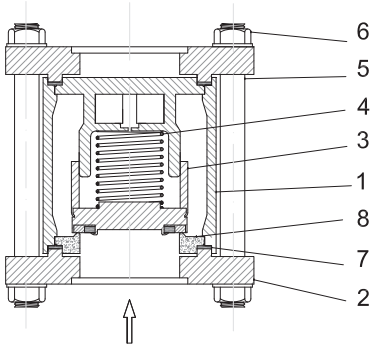


Model	Connection in/out	Dimensions			Weight (kg)
		ØA	Bmax	C	
CHKS0015	15 mm $\frac{1}{2}$ inch	80	125	90	1.1
CHKS0020	20 mm $\frac{3}{4}$ inch	80	125	90	1.2
CHKS0025	25 mm *1 inch*	82	152	120	3.8
CHKS0032	32 mm *1 $\frac{1}{4}$ inch*	82	152	120	3.8
CHKS0040	40 mm *1 $\frac{1}{2}$ inch*	114	162	130	4.2
CHKS0050	50 mm *2 inch*	136	169	137	8.5
CHKS0065	65 mm *2 $\frac{1}{2}$ inch*	162	185	156	12.0
CHKS0080	80 mm *3 inch*	184	198	175	19.0
CHKS0100	100 mm *4 inch*	219	234	200	25



Installation posititon

Construction



Item	Part	Material	Species
1	Housing	Steel	Sch40
2	Flanges	Steel	Sch40
3	Valve cone	Steel & Teflon	
4	Sping	Steel	
5	Bolts	Steel	Sch40
6	Nuts	Steel	Sch40
7	Gasket	Teflon-Non amiang	
8	Valve seat	Steel	Sch40

Liquid level sight glasses

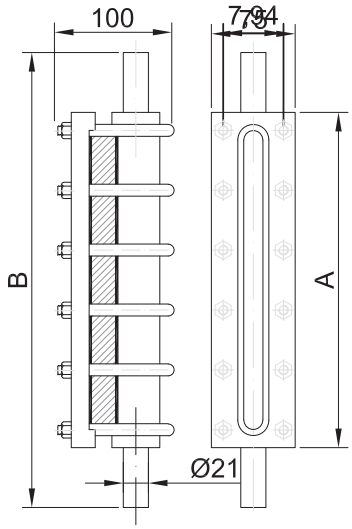
LLGB

Recommendations

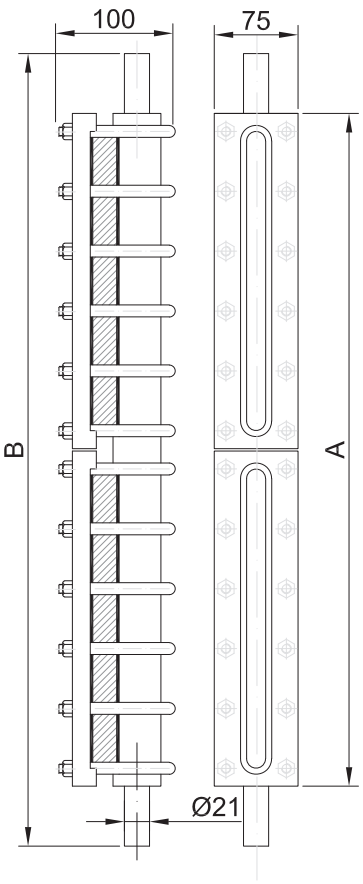
- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for observation of liquid level of liquid receiver.*
- *Connecting method: electric welding.*

Installation dimensions

LLGB0280 - 0400



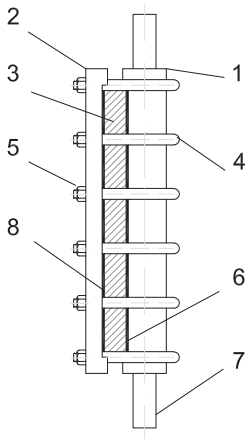
LLGB0560 - 1900



Model	Dimensions		Weight (kg)
	A	B	
LLGB0280	280	480	7
LLGB0325	325	525	8.5
LLGB0350	350	550	9
LLGB0400	400	600	10
LLGB0560	560	760	14
LLGB0700	700	900	18
LLGB0800	800	1000	20
LLGB0975	975	1075	25.5
LLGB1050	1050	1250	27
LLGB1200	1200	1400	30
LLGB1400	1400	1600	36
LLGB1500	1500	1700	38
LLGB1600	1600	1800	40
LLGB1900	1900	2100	48

SIGHT GLASS WITHOUT SHUT-OFF VALVE

Construction



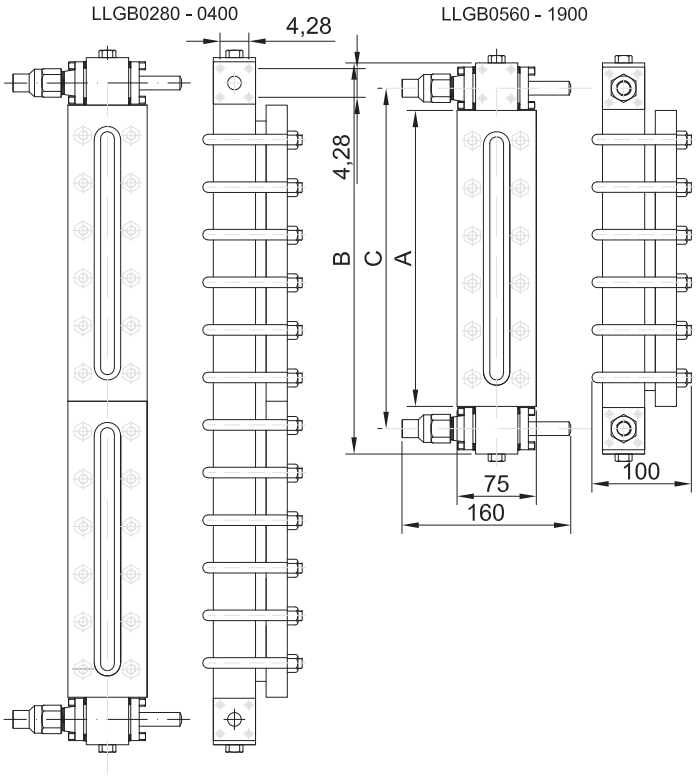
Item	Part	Material	Species
1	Back frame	Steel	SS400
2	Front frame	Steel	SS400
3	Sight glass	Kiếng *Glass*	
4	Bolts	Steel	
5	Nuts	Steel	
6	Gasket	Teplon - Non amiang	PTFE
7	Steel pipe	Steel	
8	Protective coating sight glass	Pressurized glass	PTFE

Liquid level sight glasses LLGV

Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for observation of liquid level of liquid receiver.*
- *Equipped with shut-off valves.*
- *Connecting method: electric welding.*

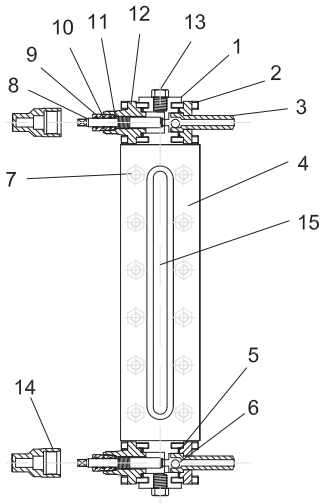
Installation dimensions



Model	Dimensions			Weight (kg)
	A	B	C	
LLGV0280	280	370	325	10.0
LLGV0325	325	415	370	11.5
LLGV0350	350	440	395	12.0
LLGV0400	400	490	445	13.0
LLGV0560	560	650	605	17.0
LLGV0700	700	790	745	21.0
LLGV0800	800	890	845	23.0
LLGV0975	975	1065	1020	28.5
LLGV1050	1050	1140	1095	30.0
LLGV1200	1200	1290	1245	33.0
LLGV1400	1400	1490	1445	39.0
LLGV1500	1500	1590	1545	41.0
LLGV1600	1600	1745	1690	43.0
LLGV1900	1900	1990	1945	51.0

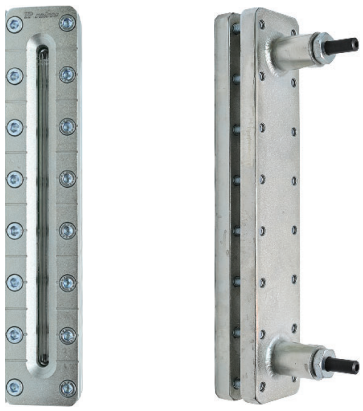
SIGHT GLASS WITH SHUT-OFF VALVES

Construction



Item	Part	Material	Species
1	Back frame	Steel	SS400
2	Bolts	Steel	
3	Steel pipe	Steel	
4	Front frame	Steel	SS400
5	Gasket	Teflon spring	
6	Safety Ball	Stainless steel	SUS 304
7	Bolts	Steel	
8	Spindle	Stainless steel	AISI 304
9	Packing gland	Stainless steel	AISI 304
10	Gasket	Teflon spring	
11	Gasket	Teflon spring	PTFE
12	Valves bonnet	Steel	
13	Pressure relief	Steel	
14	Cap	Plastic	ABS
15	Sight glass	Glass	

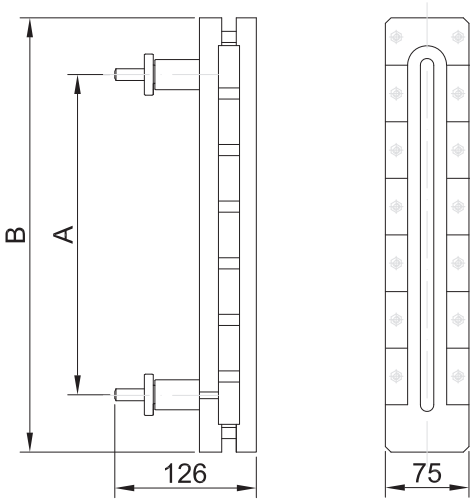
Liquid level sight glasses LLGS



Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for observation of liquid level of liquid receiver.*
- *Equipped with non return device (safety balls) to prevent refrigerant loss.*
- *Connecting method: electric welding.*

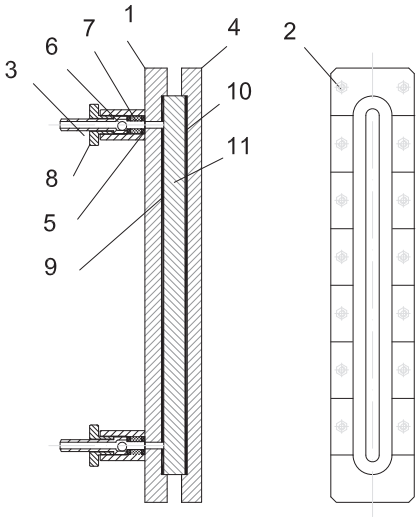
Installation dimensions



Model	Dimensions		Weight (kg)
	A	B	
LLGS0400	400	305	10

SIGHT GLASS WITH SAFETY BALLS

Construction



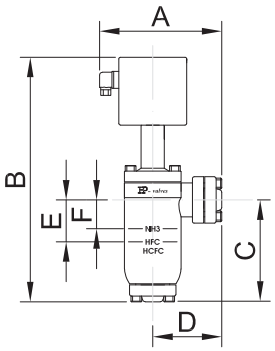
Item	Part	Material	Species
1	Back frame	Steel	SS400
2	Bolts	Steel	
3	Steel pipe	Steel	
4	Front frame	Steel	SS400
5	Gasket	Teflon spring	
6	Safety Ball	Stainless steel	SUS 304
7	Tubes	Steel	
8	Nuts	Steel	
9	Gaskets	Teplon - Non amiang	AISI 304
10	Protective coating sight glass	Teplon - Non amiang	
11	Sight glass	Glass	

Liquid level float switch LFSW

Recommendations

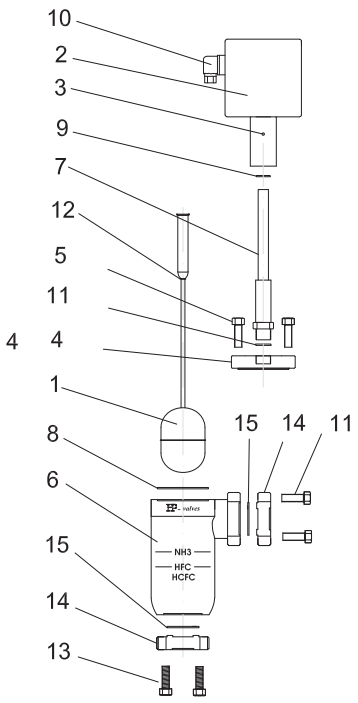
- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for control of liquid level via the float ball and electrical switch.*
- *Connecting method: socket weld.*

Installation dimensions



Model	Connection in/out	Dimensions						Weight (kg)
		A	Bmax	C	D	E	F	
LFSW0025	25 mm 1 inch	208	465	182	127	66	43	11

Construction



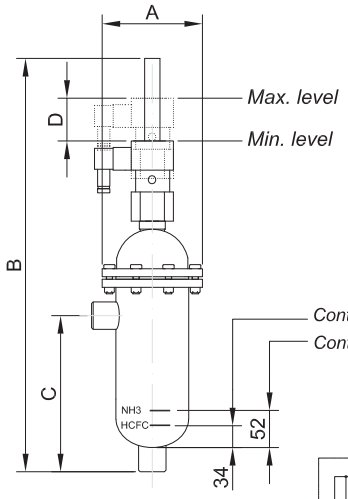
Item	Part	Material	Species
1	Float	Stainless steel	AISI 304
2	Switch box	PVC	
3	M4 x 8 Bolts	Stainless steel	AISI 304
4	Top cover	Cast - iron	
5	M12 x 35 Bolts	Stainless steel	AISI 304
6	Housing	Cast - iron	
7	Pressure tube	Stainless steel	AISI 304
8	Gasket	Teflon Fiber non-amiang	
9	Oring	Cloroprene (Neoprene)	
10	Plug	PVC	
11	Gasket	Aluminium	
12	Locking ring	Steel	
13	M12 x 35 Bolts	Stainless steel	AISI 304
14	Flanges	Steel	A352 LCC
15	Gasket	Teflon (PTFE)	

Electronic level sensors LFSE

Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for control of liquid level of liquid receiver. The float ball with a magnet is detected by magnetic sensor. Optional: 2 sensors for 2 levels.*
- *Connecting method: socket weld.*

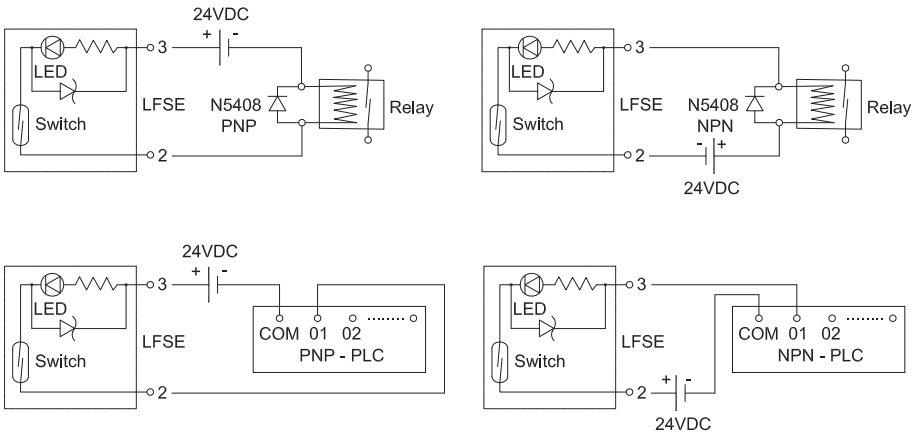
Installation dimensions



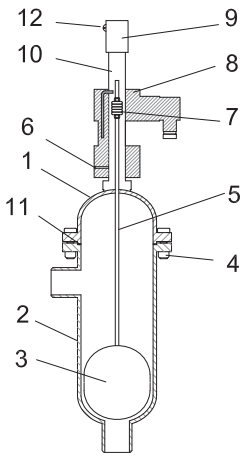
Control level for HCFC, CFC: min = 34, Max = 84
Control level for NH3: min = 52, Max = 102

Model	Connection	Dimensions				Level point	Material	Weight (kg)
		A	B	C	D			
LFSE0025	25 mm 1 inch	124	480	193	50	single	Inox *AISI 304*	3.5
LFSE1025		124	480	193	50	single	Gang *Cast iron*	3.8
LFSE2025		124	480	193	50	2 points	Inox *AISI 304*	3.5
LFSE3025		124	480	193	50	2 points	Gang *Cast iron*	3.8

Hysteresis	*Switch*	*LED*	*Circuit*
≤15mm	ON	ON	close
> 15mm	OFF	OFF	open



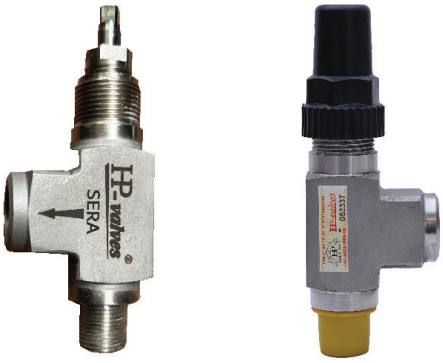
Construction



Item	Part	Material	Species
1	Top cover	Stainless steel Cast iron	AISI 304
2	Housing	Stainless steel Cast iron	AISI 304
3	Float ball	Stainless steel	AISI 304
4	M8 x 35 Bolts	Stainless steel	AISI 304
5	Float rod	Stainless steel	AISI 304
6	Fixing Screw	Stainless steel	AISI 304
7	Magnet		
8	Auto switch	ABS	
9	Limiter	Stainless steel	AISI 304
10	Pressure tube	Stainless steel	AISI 304
11	Gasket	Fiber non amiang	
12	M4 x 2 Bolts	Stainless steel	AISI 304

Service valve

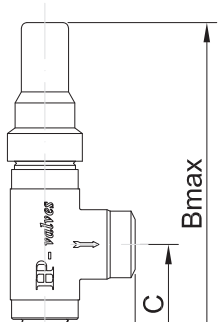
SERA



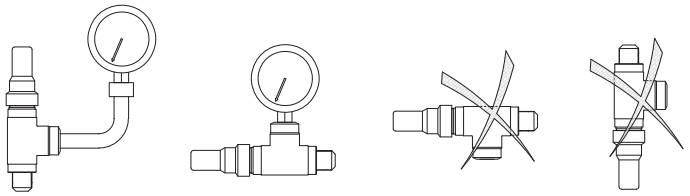
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for suction, discharge, liquid, hot gas, recirculating liquid and oil lines. Especially for connecting with pressure gauge.*
- *Connecting method: butt weld.*

Installation dimensions

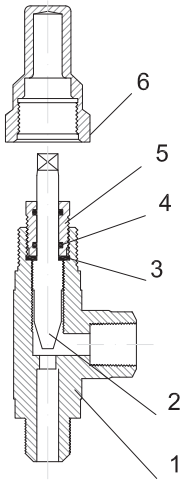


Model	Connection in/out	Dimensions			Weight (kg)
		A	Bmax	C	
SERA0010	10 mm ⅜ inch	32.5	123	43	0.4



Installation posititon

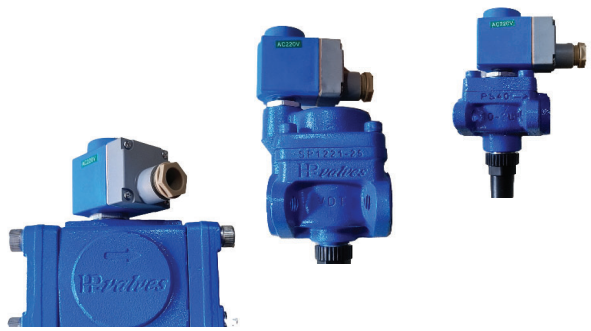
Construction



Item	Part	Material	Species
1	Housing	Stainless steel	AISI 304
2	Spindle	Stainless steel	AISI 304
3	Gasket	Teflon (PTFE)	
4	Oring	Cloroprene (Neoprene)	
5	Packing gland	Stainless steel	
6	Cap	Nhựa *Plastic*	ABS

Solenoid valves

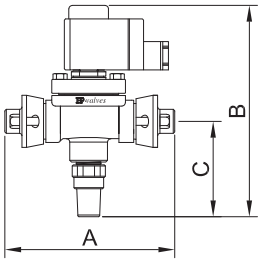
SOPS SODP

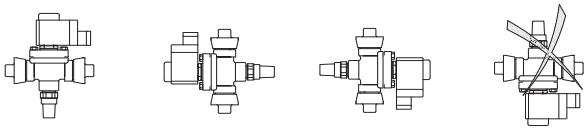


Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *SOPS, SODP control the direct on/off flow of refrigerant.*
- *Used for suction, discharge, liquid, hot gas, recirculating liquid and oil lines.*
- *Connecting method: butt weld and flanges.*

Installation dimensions

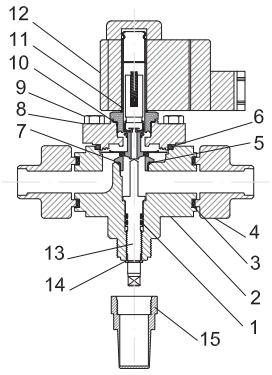




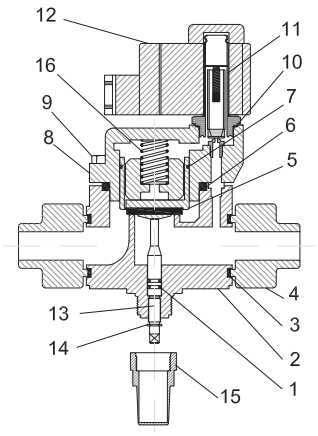
Installation posititon

Model		Connection in/out	Dimensions			Weight (kg)
Piston	Diaphragm		A	Bmax	C	
	SODP1004	10 mm ⅜ inch	149	189	84	1.8
	SODP1014	15 mm ½ inch				
	SODP1024	20 mm ¾ inch				
SOPS15-4	SODP15-4	10 mm ⅜ inch	149	189	84	2.5
SOPS1504	SODP1504	15 mm ½ inch				
SOPS1514	SODP1514	20 mm ¾ inch				
SOPS2004	SODP2004	20 mm ¾ inch	149	189	84	2.5
SOPS2014	SODP2014	25 mm *1 inch*				
SOPS2024	SODP2024	32 mm *1 ¼ inch*				
SOPS25-4		20 mm ¾ inch	164	220	79	3.1
SOPS2504		25 mm *1 inch*				
SOLS2514		32 mm *1 ¼ inch*				
SOLS3204		32 mm *1 ¼ inch*	182	164	48	4.1
SOLS4004		40 mm *1 ½ inch*	200	164	48	4.1

Construction



Item	Part	Material	Species
1	Gasket	Teflon (PTFE)	
2	Body	Cast - Iron	
3	Gasket	Teflon (PTFE)	
4	Flange	Thép *Steel*	SS400 - C20
5	Gasket	Teflon (PTFE)	
6	Gasket	Teflon (PTFE)	
7	Valve seat	Stainless Steel	
8	Bonnet	Cast iron	
9	Bolts	Stainless Steel	AISI 304
10	Gasket	Aluminium	
11	Capsule	Stainless Steel	
12	Solenoid	Copper	
13	Spindle	Stainless Steel	AISI 304
14	Blocking ring	Steel	
15	Cap	Plastic	ABS

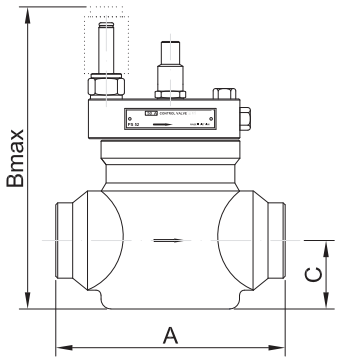


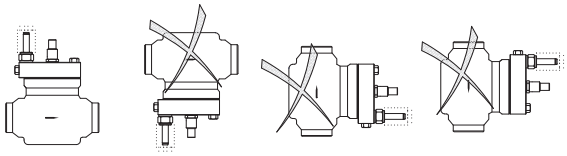
Item	Part	Material	Species
1	Gasket	Teflon (PTFE)	
2	Body	Cast - Iron	
3	Gasket	Teflon (PTFE)	
4	Flange	Steel	SS400 - C20
5	Piston	Steel	
6	Gasket	Teflon (PTFE)	
7	Piston ring	Steel	
8	Bonnet	Cast iron	
9	Bolt	Stainless Steel	AISI 304
10	Gasket	Aluminium	
11	Capsule	Stainless Steel	
12	Solenoid	Copper	
13	Spindle	Stainless Steel	AISI 304
14	Blocking ring	Steel	
15	Cap	Plastic	ABS
16	Spring	Steel	

Solenoid valves, 1-functional — SO1P

Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *SO1P control the indirect on/off flow of refrigerant.*
- *Used for suction, discharge, liquid, hot gas, recirculating liquid lines.*
- *Connecting method: butt weld.*



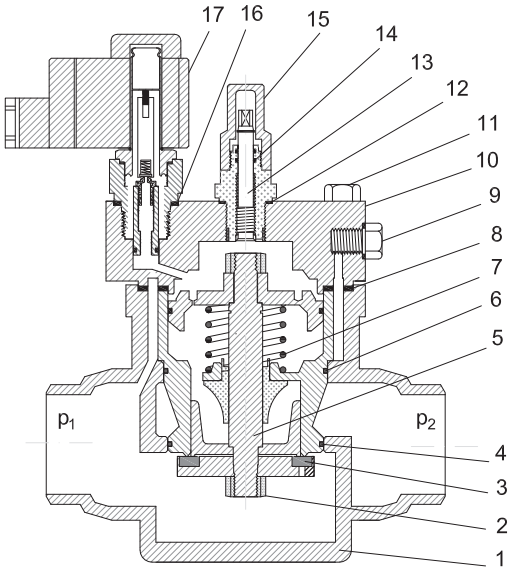


Installation posittion

Installation dimensions

Model		Connection in/out	Dimensions			Weight (kg)
40 bar	52 bar		A	Bmax	C	
SO1P25-4	SO1P25-5	20 mm $\frac{3}{4}$ inch	200	210	35	8.4
SO1P2504	SO1P2505	25 mm *1 inch*				
SO1P2514	SO1P2515	32 mm *1 $\frac{1}{4}$ inch*				
SO1P3204	SO1P3205	32 mm *1 $\frac{1}{4}$ inch*	220	225	40	9.1
SO1P3214	SO1P3215	40 mm *1 $\frac{1}{2}$ inch*				
SO1P4004	SO1P4005	40 mm *1 $\frac{1}{2}$ inch*	220	225	40	9.6
SO1P4014	SO1P4015	50 mm *2 inch*				
SO1P5004	SO1P5005	50 mm *2 inch*	250	265	60	15.2
SO1P5014	SO1P5015	65 mm *2 $\frac{1}{2}$ inch*				
SO1P6504	SO1P6505	65 mm *2 $\frac{1}{2}$ inch*	300	295	70	20.9
SO1P6514	SO1P6515	80 mm *3 inch*				
SO1P8004	SO1P8005	80 mm *3 inch*	300	295	70	22.6
SO1P1004	SO1P1005	100 mm *4 inch*	365	400	105	55.2

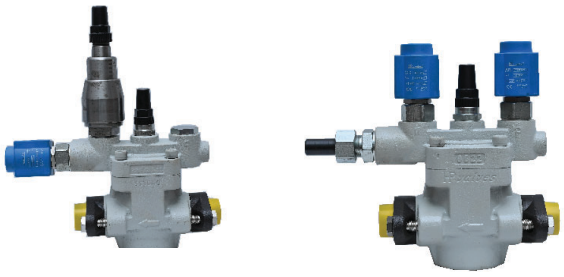
Construction



Item	Part	Material	Species
1	Body	Steel	JIS G3454
2	Nut	Steel	
3	Gasket	Teflon (PTFE)	
4	O-ring	CR / EPDM	
5	Spindle	Steel	
6	O-ring	CR / EPDM	
7	Spring	Steel	
8	Gasket	Teflon (PTFE)	
9	Bolt	Stainless Steel	AISI 304
10	Bonnet	Cast iron	
11	Bolt	Stainless Steel	AISI 304
12	Gasket	Aluminium	
13	Manual spindle	Stainless Steel	AISI 304
14	O-ring	CR / EPDM	
15	Cap	Plastic	ABS
16	Gasket	Aluminium	
17	Solenoid	Copper	

Solenoid 17 NC	OFF	ON		
Solenoid 17 NO			OFF	ON
SOL1	close	open	open	close

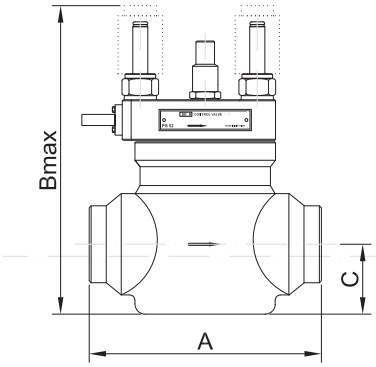
Solenoid valves, 2-step opened — SO2P



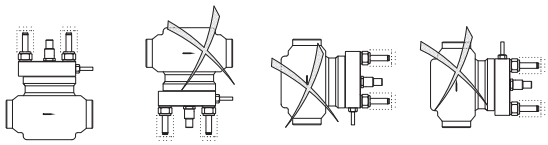
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *SO2P control the indirect on/off flow in 2 steps.*
- *Used in the system of the evaporator defrost with hot gas.*
- *Connecting method: butt weld.*

Installation dimensions

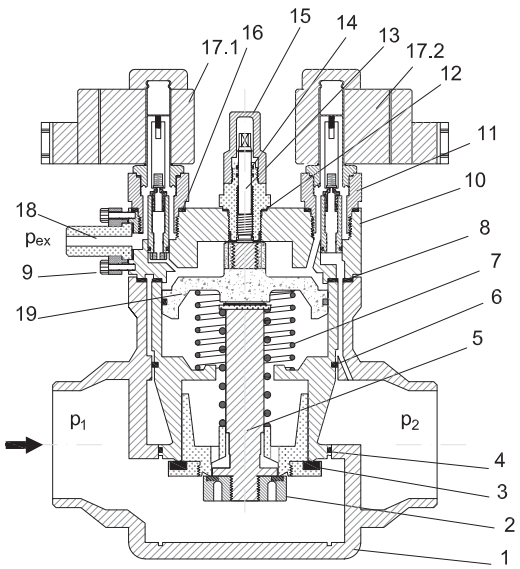


Model		Connection in/out	Dimensions			Weight (kg)
40 bar	52 bar		A	Bmax	C	
SO2P25-4	SO2P25-5	20 mm $\frac{3}{4}$ inch	200	210	35	8.7
SO2P2504	SO2P2505	25 mm *1 inch*				
SO2P2514	SO2P2515	32 mm *1 $\frac{1}{4}$ inch*				
SO2P3204	SO2P3205	32 mm *1 $\frac{1}{4}$ inch*	220	225	40	9.4
SO2P3214	SO2P3215	40 mm *1 $\frac{1}{2}$ inch*				
SO2P4004	SO2P4005	40 mm *1 $\frac{1}{2}$ inch*	220	225	40	10
SO2P4014	SO2P4015	50 mm *2 inch*				
SO2P5004	SO2P5005	50 mm *2 inch*	250	265	60	15.6
SO2P5014	SO2P5015	65 mm *2 $\frac{1}{2}$ inch*				
SO2P6504	SO2P6505	65 mm *2 $\frac{1}{2}$ inch*	300	295	70	21.3
SO2P6594	SO2P6595	80 mm *3 inch*				
SO2P8004	SO2P8005	80 mm *3 inch*	300	295	70	23
SO2P1004	SO2P1005	100 mm *4 inch*	365	400	105	55.6



Installation posititon

Construction



Item	Part	Material	Species
1	Body	Steel	JIS G3454
2	Nut	Steel	
3	Gasket	Teflon (PTFE)	
4	O-ring	CR / EPDM	
5	Spindle	Steel	
6	O-ring	CR / EPDM	
7	Spring	Steel	
8	Gasket	Teflon (PTFE)	
9	Bolt	Stainless Steel	AISI 304
10	Bonnet	Cast iron	
11	Bolt	Stainless Steel	AISI 304
12	Gasket	Aluminium	
13	Manual spindle	Stainless Steel	AISI 304
14	O-ring	CR / EPDM	
15	Cap	Plastic	ABS
16	Gasket	Aluminium	
17	Solenoid	Copper	
18	Connector for exteral pressure	Steel	
19	Piston	Stainless Steel	AISI 304

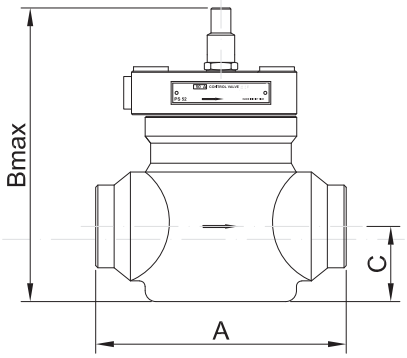
Solenoid 17.1	close	open	close
Solenoid 17.2	close	close	open
SOL2	close 100% when $p_1 = p_2$	$p_1 - p_2 > 1.3$ bar: partly open $p_1 - p_2 \leq 1.3$ bar: fully open	2-step close

Pilot-operated valves, 3-functional — SO3P

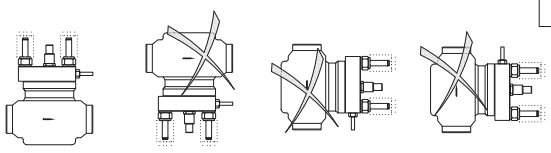
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *SO3P control on/off, the inlet, outlet, differential pressure or temperature depend on installed pilot valve.*
- *Used for gas, pump circulated refrigerant return lines.*
- *Connecting method: butt weld.*

Installation dimensions

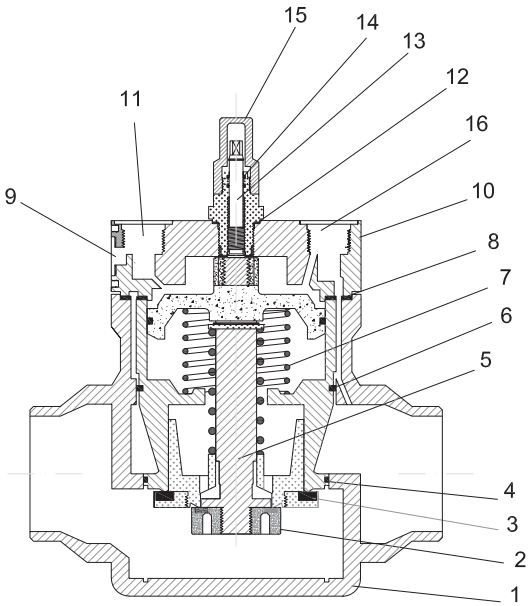


Model		Connection in/out	Dimensions			Weight (kg)
40 bar	52 bar		A	Bmax	C	
SO3P25-4	SO3P25-5	20 mm $\frac{3}{4}$ inch	200	210	35	8.7
SO3P2504	SO3P2505	25 mm *1 inch*				
SO3P2514	SO3P2515	32 mm *1 $\frac{1}{4}$ inch*				
SO3P3204	SO3P3205	32 mm *1 $\frac{1}{4}$ inch*	220	225	40	9.4
SO3P3214	SO3P3215	40 mm *1 $\frac{1}{2}$ inch*				
SO3P4004	SO3P4005	40 mm *1 $\frac{1}{2}$ inch*	220	225	40	10
SO3P4014	SO3P4015	50 mm *2 inch*				
SO3P5004	SO3P5005	50 mm *2 inch*	250	265	60	15.6
SO3P5014	SO3P5015	65 mm *2 $\frac{1}{2}$ inch*				
SO3P6504	SO3P6505	65 mm *2 $\frac{1}{2}$ inch*	300	295	70	21.3
SO3P6514	SO3P6515	80 mm *3 inch*				
SO3P8004	SO3P8005	80 mm *3 inch*	300	295	70	23
SO3P1004	SO3P1005	100 mm *4 inch*	365	400	105	55.6



Installation posititon

Construction



Item	Part	Material	Species
1	Body	Steel	JIS G3454
2	Tán *Nut*	Steel	
3	Gasket	Teflon (PTFE)	
4	O-ring	CR / EPDM	
5	Spindle	Steel	
6	O-ring	CR / EPDM	
7	Sprlng	Steel	
8	Gasket	Teflon (PTFE)	
9	Port SR1		
10	Bonnet	Cast iron	
11	Port SR2	Stainless Steel	
12	Gasket	Aluminium	
13	Manual spindle	Stainless Steel	AISI 304
14	O-ring	CR / EPDM	
15	Cap	Plastic	ABS
16	Port PR		

Electronic actuator motor valves - stainless steel RCMS

Recommendations

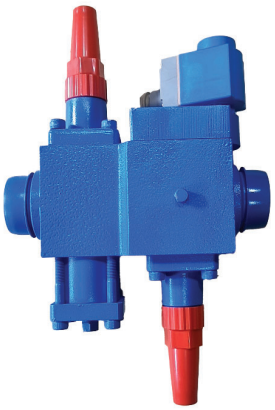
- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *RCMC control the on/off flow of refrigerant by actuator control motor.*
- *Used for suction, discharge, liquid, hot gas, recirculating liquid lines.*
- *Connecting method: butt weld.*

Installation dimensions

Construction

Valves station

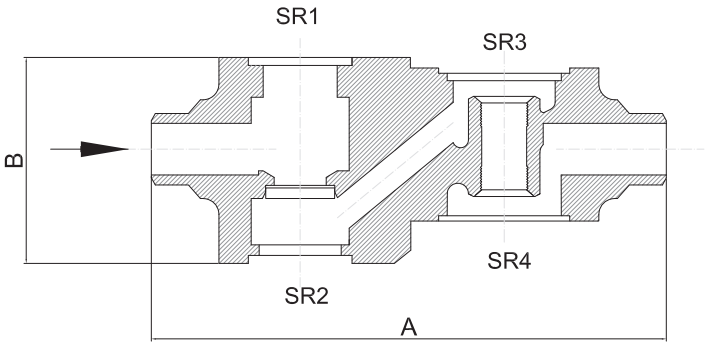
GR4V



Recommendations

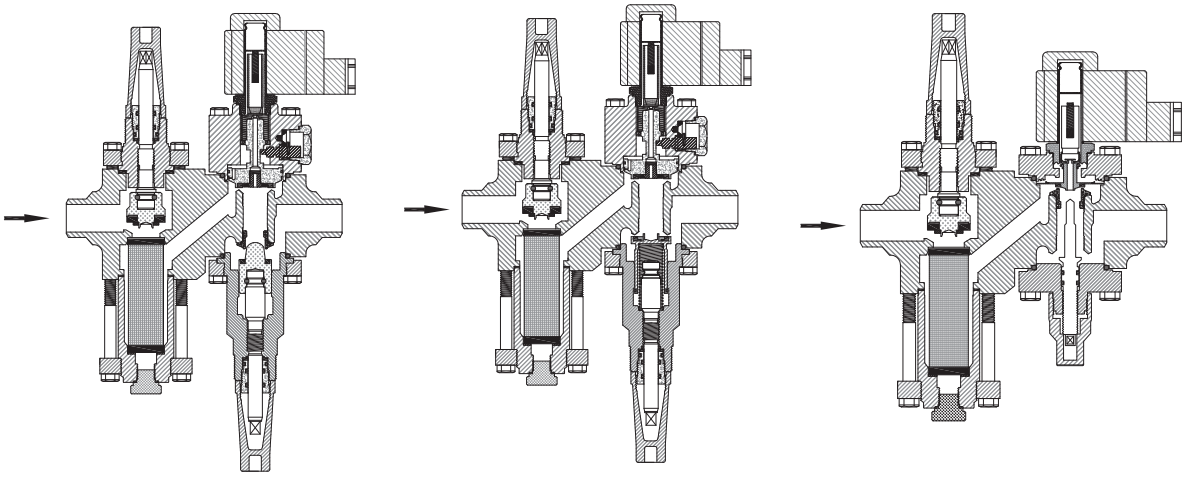
- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *GRV4 has 4 ports for installation of: shut-off, filter, expansion, regulating, check valves. The combination of the valves creates 6 differential functions.*
- *Usually Used for control of evaporator: liquid supply, expansion, hot gas supply and condensate relief; also for liquid supply and expansion to LP-receiver...*
- *Connecting method: butt weld.*

Installation dimensions

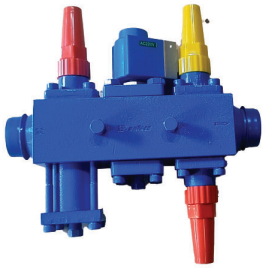


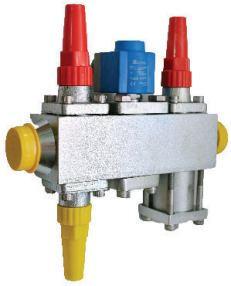
Model	Connection in/out	Dimensions		
		A	B	C
GRV4..015	15 mm $\frac{1}{2}$ inch	195	66	70
GRV4..020	20 mm $\frac{3}{4}$ inch	195	66	70
GRV4..025	25 mm *1 inch*	205	90	82
GRV4..032	32 mm *1 $\frac{1}{4}$ inch*	215	90	82
GRV4..040	40 mm *1 $\frac{1}{2}$ inch*	215	90	82

Port	SR1	SR2	SR3	SR4				
Valve	Shut-off	Filter	Solenoid	Expansion	Regulate	Check & stop	Shut-off	Manual opener
GRV41....	X	X	X	X				
GRV42....	X	X	X		X			
GRV43....	X	X	X			X		
GRV44....	X	X	X				X	
GRV45....	X	X	X					
GRV46....	X	X	X					X



GR4V2015 GR4V3015 GR4V6015

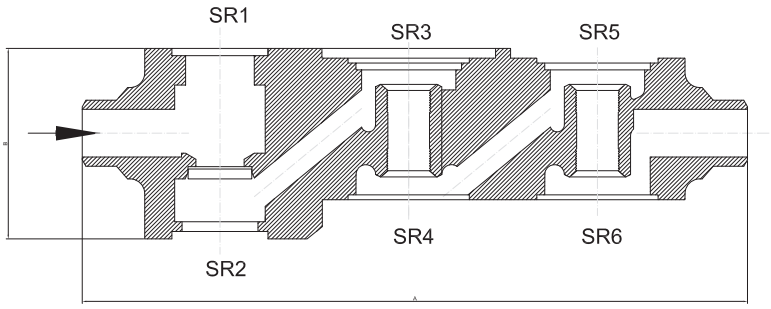




Recommendations

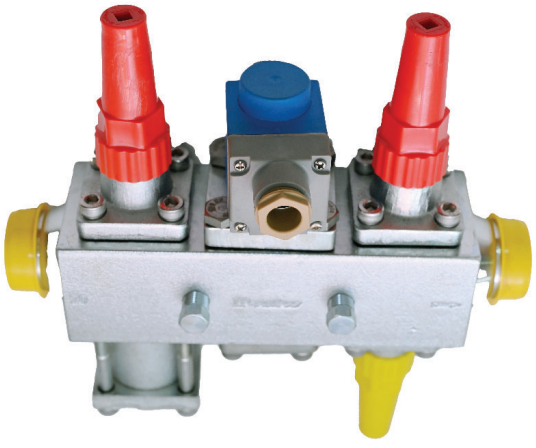
- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *GRV6 has 6 ports for installation of: shut-off, filter, expansion, regulating, check valves. The combination of the valves creates 6 differential functions.*
- *Usually Used for control of evaporator: liquid supply, expansion, hot gas supply and condensate relief; also for liquid supply and expansion to LP-receiver...*
- *Connecting method: butt weld.*

Installation dimensions



Nhãn *Model*	Cỡ nối *Connection in/out*	Kích thước *Dimensions*		
		A	B	C
GRV6..015	15 mm $\frac{1}{2}$ inch	265	66	70
GRV6..020	20 mm $\frac{3}{4}$ inch	265	66	70
GRV6..025	25 mm *1 inch*	272	90	90
GRV6..032	32 mm *1 $\frac{1}{4}$ inch*	300	90	90
GRV6..040	40 mm *1 $\frac{1}{2}$ inch*	300	90	90

Port	SR1	SR2	SR3	SR4		SR5	SR6	
Code	Shut-off	Filter	Solenoid	Expansion	Manual opener	Regulate	Check & stop	Shut-off
GRV61....	X	X	X	X				X
GRV62....	X	X	X			X		X
GRV63....	X	X	X	X			X	
GRV64....	X	X	X			X	X	
GRV65....	X	X	X	X	X			X
GRV66....	X	X	X		X	X		X





Recommendations

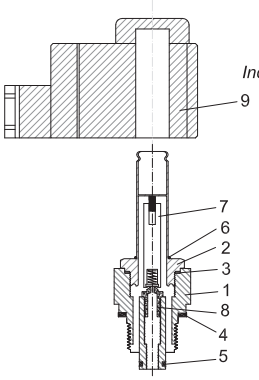
- Maximal working pressure MWP: 52 bar
- Temperature range: -50°C / +150°C
- Refrigerants : HCFC, CFC, R717, R744
- The pilots valves are installed in the main valve SO1P, SO3P, SOS1, SOS2, SOS3, GRV4 or GRV6 for regulating pressure, temperature and ON/OFF function.
- PILOTCOP is used for constant pressure.
- PILOTCDP is used for constant differential pressure.
- PILOTCOT is used for constant temperature.
- Connecting method: threaded M24.

Model	Desription
PILOTSOL-12W	Coil power 12W
PILOTSOL-15W	Coil power 15W
BOLT P	Bolt for port P of parallel channel
BOLT A	Bolt for port A of serial channel

Model	Operating Range
PILOTCOP-L	-0.46 - 7bar -7 - 102psi
PILOTCOP-M	0 - 10bar 0 - 145psi
PILOTCOP-H	0 - 20bar 0 - 290psi
PILOTCDP-L	0 - 10bar 0 - 145psi
PILOTCDP-H	0 - 20bar 0 - 290psi
PILOTCEP-L	0 - 10bar 0 - 145psi
PILOTCEP-H	0 - 20bar 0 - 290psi

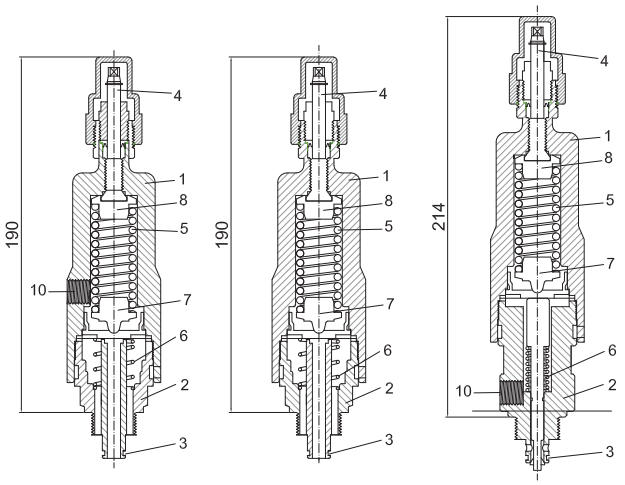
PILOTSOL

Induction Solenoid valve



Item	Part	Material	Species
1	Body	Stainless Steel	AISI 304
2	Capsule	Stainless Steel	AISI 304
3	Gasket	Aluminum	
4	Gasket	Aluminum	
5	O-ring	Teflon (PTFE)	
6	O-ring	Teflon (PTFE)	
7	Cartridge	Stainless Steel	AISI 430
8	Valve seat	Stainless Steel	AISI 304
9	Solenoid		12W / 15W

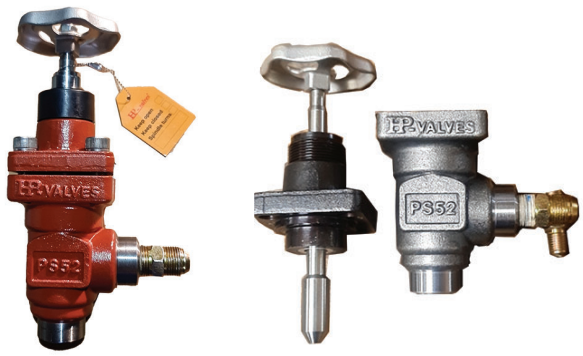
PILOTCDP PILOTCOP PILOTCEP



Item	Part	Material	Species
1	Body	Stainless Steel	AISI 304
2	Capsule	Stainless Steel	AISI 304
3	Oring	Neoprene	
4	Spindle	Stainless Steel	AISI 304
5	Spring	Steel	
6	Spring	Steel	
7	Valve Cone	Stainless Steel	AISI 304
8	Valve seat	Stainless Steel	AISI 304
9	Cap	Plastic	ABS
10	Connecting port for external pressure		

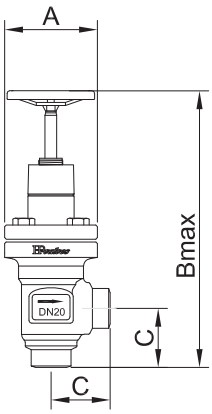
Oil drain valve, angle

ODRA



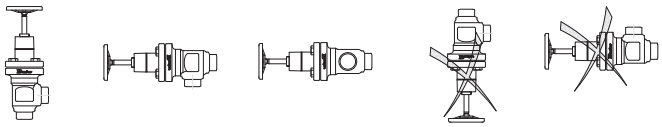
Recommendations

- *Maximal working pressure MWP: 52 bar*
- *Temperature range: -50°C / +150°C*
- *Refrigerants : HCFC, CFC, R717, R744*
- *Used for oil drain.*
- *Connecting method: threaded inside pipe and butt weld.*



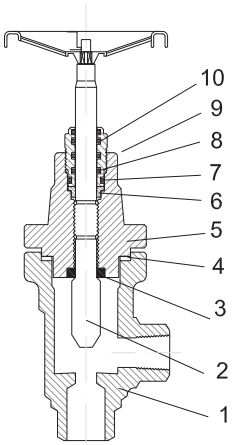
Installation dimensions

Model	Connection in/out	Dimensions			Weight (kg)
		A	Bmax	C	
ODRA0020	20 mm $\frac{3}{4}$ inch	54	195	41	1.8



Installation posititon

Construction



Item	Part	Material	Species
1	Housing	Steel	A352 LCC, S20C
		Stainless steel	AISI 304
2	Spindle	Stainless steel	AISI 304
3	Gasket	Aluminium	
4	Gasket	Teflon-Fiber non amiang	
5	Valve bonnet	Steel	S20C
6	Gasket	Teflon	PTFE
7	Oring	Cloroprene (Neoprene)	
8	Oring	Cloroprene (Neoprene)	
9	Cap	Aluminium or Plastic	Alu or ABS
10	Packing gland	Stainless steel	AISI 304

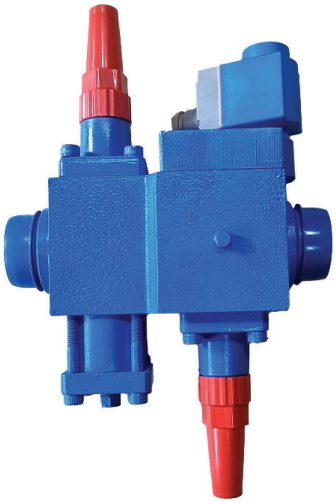
Product samples

SO1P0065

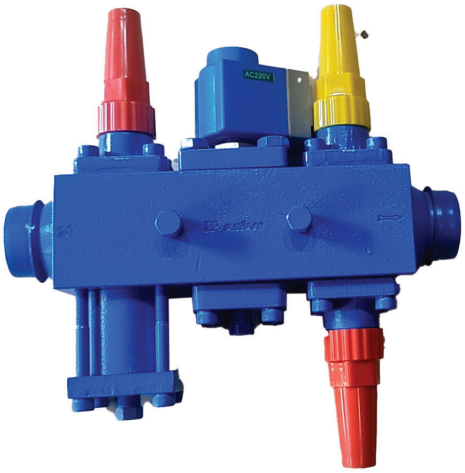
SO3P0065

PM1P0025

PM3P0125

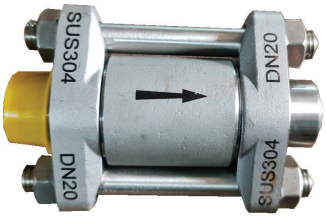


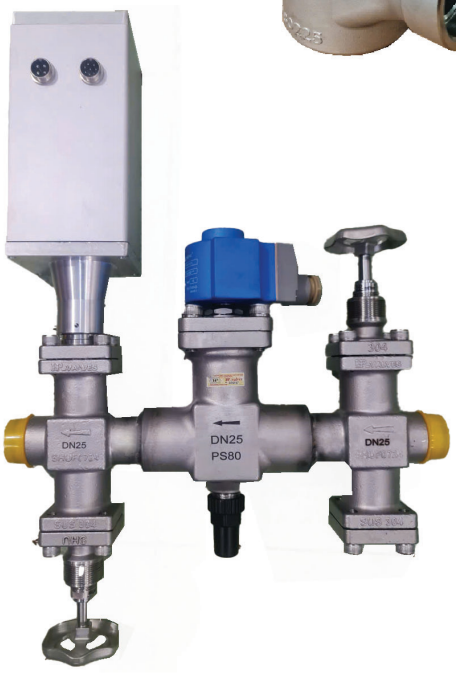
GR4V4025

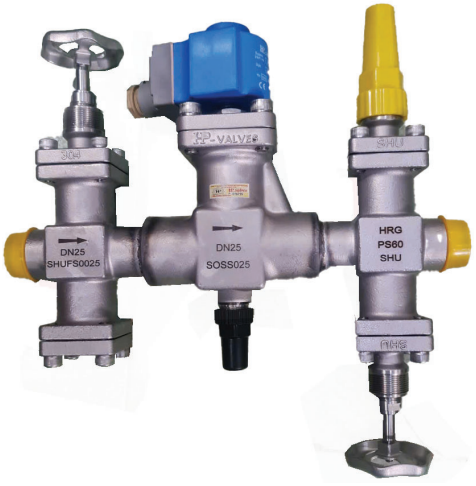


GR6V1025

Product samples - stainless steel







Products in plant

Products in plant

Valve selection

Valve formular and symbols in the selection tables

Valve formular

$$G = K_v \cdot \sqrt{\rho \cdot 1000 \cdot \Delta p}$$

G	[kg/h]	Mass flow through the valv
K_v	[m^3/h]	Valve constant K_v
ρ	[kg/m^3]	Density of the refrigerant b
Δp	[bar]	Actual pressure loss acros

Symbol in Selection tables

Δp	[bar]	Actual pressure loss acros
ΔT	[K]	Equivalent temperature los
Δt_{subc}	[K]	Subcooing of refrigerant liq
Δt_{superh}	[K]	Superheat of refrigerant su
G_{hotgas}	[kg/h]	Hot gas volume flow
n	[Times]	Cirlulating rate of pumped r
Load	[%]	Load rate of valve
Q_O	[kW]	Evaporating capacity
t_O	[°C]	Evaporating temperature
t_C	[°C]	Condensing temperature
t_{hotgas}	[°C]	Discharge hot gas tempera

Selection tables are based on condensing temperature t_C = 35°C, subcooling Δt_{subc} = 2K. For other condensing temperature, the evaporating capacity multiply with correction factor below, use this result to choose the closest (not the next large) valve size.

Correction factors of evaporating capacity Q_O for other condensing temperature

Cond.	Evaporator temperature t_o(°C)										
t_C(°C)	-47	-40	-35	-30	-25	-20	-15	-10	-5	0	5
20	1.05	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
22	1.04	1.04	1.04	1.04	1.04	1.04	1.03	1.03	1.03	1.03	1.03
24	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03
26	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
28	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
32	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
34	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
36	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
38	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.97	0.97	0.97	0.97
40	0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
42	0.94	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
44	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
46	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
48	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
50	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91

The values of this table are only applied for: Liquid line, Suction line and Discharge line.

Valves for Hight pressure liquid line

R717 — **High pressure liquid line - SHUT-OFF VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, ΔT = 0.03K										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Shut-off valves, straight	SHUS0010	71	72	72	73	73	74	74	74	75	75	76
	SHUS0015	112	113	114	115	116	116	117	118	118	119	119
	SHUS0020	217	220	221	223	224	226	227	228	229	231	232
	SHUS0025	377	381	384	387	389	392	394	396	399	401	402
	SHUS0032	549	555	559	563	566	570	573	577	580	583	585
	SHUS0040	722	730	736	741	746	750	755	759	763	767	771
	SHUS0050	1417	1433	1443	1453	1463	1472	1481	1490	1498	1505	1512
	SHUS0065	2217	2241	2258	2274	2289	2304	2318	2331	2343	2355	2366
	SHUS0080	3475	3512	3538	3563	3587	3610	3632	3652	3672	3690	3707
	SHUS0100	6172	6239	6285	6329	6371	6412	6451	6488	6522	6555	6585
Shut-off valves, angle	SHUA0010	103	104	105	105	106	107	108	108	109	109	110
	SHUA0015	160	162	163	164	165	166	167	168	169	170	171
	SHUA0020	320	323	326	328	330	332	334	336	338	340	341
	SHUA0025	549	555	559	563	566	570	573	577	580	583	585
	SHUA0032	823	832	838	844	850	855	860	865	870	874	878
	SHUA0040	1033	1044	1052	1059	1067	1073	1080	1086	1092	1097	1102
	SHUA0050	1714	1733	1746	1758	1770	1781	1792	1802	1812	1821	1829
	SHUA0065	2743	2773	2793	2813	2832	2850	2867	2883	2899	2913	2926
	SHUA0080	4115	4159	4190	4219	4248	4275	4301	4325	4348	4370	4390
	SHUA0100	6332	6400	6447	6493	6537	6578	6618	6656	6691	6725	6755

R717 — **High pressure liquid line - MESH STRAINERS**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, ΔT = 0.08K										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Mesh strainers, straight	STRS0015	103	104	105	106	106	107	108	108	109	109	110
	STRS0020	214	216	218	219	221	222	223	225	226	227	228
	STRS0025	424	428	431	434	437	440	443	445	448	450	452
	STRS0032	721	728	734	739	744	749	753	757	762	765	769
	STRS0040	772	780	786	792	797	802	807	812	816	820	824
	STRS0050	1390	1405	1415	1425	1435	1444	1453	1461	1469	1476	1483
	STRS0065	1699	1717	1730	1742	1753	1765	1775	1785	1795	1804	1812
	STRS0080	3167	3202	3225	3248	3270	3291	3311	3330	3347	3364	3379
	STRS0100	4910	4963	4999	5034	5068	5101	5131	5161	5188	5214	5238
Mesh strainers, angle	STRA0015	135	136	137	138	139	140	141	142	142	143	144
	STRA0020	281	284	286	288	290	292	294	295	297	299	300
	STRA0025	554	560	564	568	572	576	579	583	586	589	591
	STRA0032	942	952	960	966	973	979	985	991	996	1001	1005
	STRA0040	1010	1021	1028	1035	1042	1049	1055	1061	1067	1072	1077
	STRA0050	2245	2269	2286	2302	2317	2332	2346	2360	2372	2384	2395
	STRA0065	2217	2241	2258	2274	2289	2304	2317	2331	2343	2355	2365
	STRA0080	4157	4202	4233	4263	4292	4319	4345	4370	4393	4415	4435
	STRA0100	6414	6483	6531	6577	6621	6664	6704	6742	6778	6812	6843

Valve selection

Valves for Hight pressure liquid line (continued)

R717 — **High pressure liquid line - SOLENOID VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, DN10-20: Δp = 0.05 bar, DN25-40: Δp = 0.07 bar										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Diaphragm solenoid	SODP0010	77	78	78	79	79	80	80	81	81	81	82
	SODP/PS0015	138	140	141	142	142	143	144	145	146	147	147
	SODP/PS0020	230	233	234	236	237	239	240	242	243	244	245
	SOPS0025	605	611	616	620	624	628	632	636	639	642	645
	SOPS0032	968	978	985	992	999	1005	1011	1017	1023	1028	1032
	SOPS0040	1512	1528	1540	1550	1561	1571	1580	1589	1598	1606	1613

R717 — **High pressure liquid line - HAND EXPANSION VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, Load = 70%										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Hand exp., str.	HRGS0010	57	57	57	57	56	56	55	53	52	49	47
	HRGS0015	535	535	534	531	526	520	510	498	482	462	436
	HRGS0020	573	574	572	569	564	557	547	534	516	495	467
	HRGS0025	2599	2600	2594	2580	2557	2524	2479	2419	2341	2242	2116
	HRGS0032	2638	2638	2632	2618	2595	2561	2515	2454	2375	2275	2147
Hand exp., ang.	HRGA0010	57	57	57	57	56	56	55	53	52	49	47
	HRGA0015	535	535	534	531	526	520	510	498	482	462	436
	HRGA0020	573	574	572	569	564	557	547	534	516	495	467
	HRGA0025	2599	2600	2594	2580	2557	2524	2479	2419	2341	2242	2116
	HRGA0032	2638	2638	2632	2618	2595	2561	2515	2454	2375	2275	2147

R717 — **High pressure liquid line - NON RETURN VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, DN15-32: ΔT = 0.1 bar, DN40-65: ΔT = 0.06 bar										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Non return valves	CHKS0015	181	183	184	185	187	188	189	190	191	192	193
	CHKS0020	289	292	294	296	298	300	302	304	306	307	308
	CHKS0025	578	585	589	593	597	601	604	608	611	614	617
	CHKS0032	904	913	920	927	933	939	944	950	955	960	964
	CHKS0040	840	849	855	861	867	873	878	883	888	892	896
	CHKS0050	1232	1245	1254	1263	1272	1280	1288	1295	1302	1308	1314
	CHKS0065	2100	2122	2138	2153	2168	2181	2195	2207	2219	2230	2240

Valve selection

Valves for Pumped circulating liquid line

R717 **Pumped circulating liquid line - SHUT-OFF VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on ΔT = 0.03K, n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Shut-off valves, straight	SHUS0010	5.8	6.7	7.4	8.1	8.7	9.4	10.1	10.7	11.4	12.1	12.7
	SHUS0015	9.2	10.6	11.7	12.7	13.8	14.8	15.9	17.0	18.0	19.1	20.1
	SHUS0020	18	21	23	25	27	29	31	33	35	37	39
	SHUS0025	31	36	39	43	46	50	54	57	61	64	68
	SHUS0032	45	52	57	62	68	73	78	83	88	93	98
	SHUS0040	59	69	75	82	89	96	103	109	116	123	129
	SHUS0050	116	135	148	161	174	188	201	215	228	241	254
	SHUS0065	181	211	231	252	273	294	315	336	357	377	397
	SHUS0080	284	330	362	395	428	460	493	526	559	591	622
	SHUS0100	505	586	644	701	759	818	876	935	993	1050	1106
	SHUS0125	879	1020	1120	1221	1322	1424	1525	1627	1728	1828	1925
	SHUS0150	1117	1296	1423	1551	1679	1808	1938	2067	2195	2321	2445
	SHUS0200	1871	2170	2384	2598	2813	3029	3246	3462	3677	3889	4095
Shut-off valves, angle	SHUA0010	2.05	9.77	10.73	11.69	12.66	13.63	14.61	15.58	16.55	17.50	18.43
	SHUA0015	13.10	15.19	16.68	18.18	19.69	21.20	22.72	24.23	25.74	27.22	28.67
	SHUA0020	26	30	33	36	39	42	45	48	51	54	57
	SHUA0025	45	52	57	62	68	73	78	83	88	93	98
	SHUA0032	67	78	86	94	101	109	117	125	132	140	147
	SHUA0040	85	98	108	117	127	137	147	156	166	176	185
	SHUA0050	140	163	179	195	211	227	243	260	276	292	307
	SHUA0065	225	260	286	312	338	363	389	415	441	467	491
	SHUA0080	337	391	429	468	506	545	584	623	662	700	737
	SHUA0100	518	601	660	720	779	839	899	959	1018	1077	1134
	SHUS0125	962	1115	1225	1335	1446	1557	1668	1779	1890	1999	2105
	SHUS0150	1384	1606	1764	1922	2081	2241	2402	2562	2721	2878	3031
	SHUS0200	2058	2387	2622	2857	3094	3332	3570	3808	4045	4277	4505

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

R717 **Pumped circulating liquid line - HAND REGULATING VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on ΔT = 0.2, n = 5, Load = 70%										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Hand regu., straigh	HRGS0010	2.0	2.3	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4
	HRGS0015	17	20	22	23	25	27	29	31	33	35	37
	HRGS0020	17	20	22	23	25	27	29	31	33	35	37
	HRGS0025	67	78	86	94	102	109	117	125	133	140	148
	HRGS0032	67	78	86	94	102	109	117	125	133	140	148
Hand regu., angle	HRGA0010	2.0	2.3	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4
	HRGA0015	17	20	22	23	25	27	29	31	33	35	37
	HRGA0020	17	20	22	23	25	27	29	31	33	35	37
	HRGA0025	67	78	86	94	102	109	117	125	133	140	148
	HRGA0032	67	78	86	94	102	109	117	125	133	140	148

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

Valve selection

Valves for Pumped circulating liquid line (continued)

R717 — **Pumped circulating liquid line - MESH STRAINERS**

Valve	Valve Model	Q_O (kW) at t_O based on ΔT = 0.04K, n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Mesh strainers, straight	STRS0015	5.6	6.5	7.2	7.8	8.4	9.1	9.7	10.4	11.0	11.7	12.3
	STRS0020	11.7	13.5	14.9	16.2	17.5	18.9	20.2	21.6	22.9	24.2	25.5
	STRS0025	23	27	29	32	35	37	40	43	45	48	51
	STRS0032	39	46	50	55	59	64	68	73	77	82	86
	STRS0040	42	49	54	58	63	68	73	78	83	88	92
	STRS0050	76	88	97	105	114	123	132	140	149	158	166
	STRS0065	93	107	118	129	139	150	161	171	182	193	203
	STRS0080	173	200	220	240	260	280	300	320	340	359	378
	STRS0100	268	311	341	372	403	434	465	496	526	557	586
	STRS0125	456	529	581	633	685	738	791	843	896	947	998
	STRS0150	598	694	762	831	900	969	1038	1107	1176	1244	1310
	STRS0200	946	1098	1205	1314	1422	1532	1641	1751	1859	1967	2071
Mesh strainers, angle	STRA0015	7.3	8.5	9.4	10.2	11.0	11.9	12.7	13.6	14.4	15.3	16.1
	STRA0020	15	18	20	21	23	25	27	28	30	32	34
	STRA0025	30	35	39	42	45	49	52	56	59	63	66
	STRA0032	51	60	65	71	77	83	89	95	101	107	113
	STRA0040	55	64	70	76	83	89	96	102	108	114	121
	STRA0050	122	142	156	170	184	198	212	227	241	255	268
	STRA0065	121	140	154	168	182	196	210	224	238	251	265
	STRA0080	227	263	289	315	341	367	393	420	446	471	497
	STRA0100	350	406	446	486	526	567	607	648	688	727	766
	STRS0125	594	689	757	825	893	962	1031	1099	1167	1235	1300
	STRS0150	966	1120	1230	1341	1452	1563	1675	1787	1898	2007	2114
	STRS0200	1238	1436	1577	1719	1861	2004	2147	2290	2433	2573	2709

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

R717 — **Pumped circulating liquid line - SOLENOID VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on n = 5, DN10-20: Δp = 0.05 bar, DN25-40: Δp = 0.07 bar										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Diaphragm solenoid	SODP0010	21.7	21.5	21.2	20.9	20.5	20.2	19.9	19.5	19.2	18.8	18.4
	SODP0015	39.1	38.6	38.1	37.6	37.0	36.4	35.7	35.1	34.5	33.8	33.2
	SODP0020	65.1	64.4	63.6	62.6	61.6	60.6	59.6	58.5	57.5	56.4	55.3
	SODP0025	171	169	167	165	162	159	157	154	151	148	145
	SODP0032	274	271	267	263	259	255	251	246	242	237	233
	SODP0040	428	423	418	412	405	398	391	385	378	371	363

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

R717 — **Pumped circulating liquid line - NON RETURN VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on n = 5, DN15-32: Δp = 0.1 bar, DN40-65: Δp = 0.06 bar										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Non return valves	CHKS0015	102	101	100	98	97	95	94	92	90	89	87
	CHKS0020	164	162	160	157	155	152	150	147	144	142	139
	CHKS0025	327	324	320	315	310	305	299	294	289	284	278
	CHKS0032	512	506	499	492	484	476	468	460	451	443	434
	CHKS0040	475	470	464	457	450	443	435	427	420	412	404
	CHKS0050	697	689	681	671	660	649	638	627	615	604	592
	CHKS0065	1189	1175	1160	1143	1125	1106	1087	1068	1049	1029	1009

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

Valve selection

Valves for Suction line

R717 — **Saturated vapour suction line - SHUT-OFF VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, ΔT = 0.2K										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Shut-off valves, straight	SHUS0010	1.4	2.0	2.5	3.2	3.9	4.8	5.9	7.1	8.4	10.0	11.8
	SHUS0015	2.2	3.2	4.0	5.0	6.2	7.6	9.3	11.2	13.3	15.8	18.7
	SHUS0020	4	6	8	10	12	15	18	22	26	31	36
	SHUS0025	8	11	14	17	21	26	31	38	45	53	63
	SHUS0032	11	16	20	25	31	37	45	55	65	77	91
	SHUS0040	14	20	26	32	40	49	60	72	86	102	120
	SHUS0050	28	40	51	64	79	97	117	141	169	200	236
	SHUS0065	44	63	80	100	123	151	184	221	264	313	369
	SHUS0080	69	98	125	156	194	237	288	346	413	490	579
	SHUS0100	123	175	221	278	344	421	511	615	734	871	1028
	SHUS0125	214	304	385	483	598	733	889	1070	1278	1516	1789
	SHUS0150	271	386	490	614	760	931	1130	1359	1623	1926	2272
	SHUS0200	455	647	820	1028	1273	1560	1892	2276	2719	3226	3806
Shut-off valves, angle	SHUA0010	2.0	2.9	3.7	4.6	5.7	7.0	8.5	10.2	12.2	14.5	17.1
	SHUA0015	3.2	4.5	5.7	7.2	8.9	10.9	13.2	15.9	19.0	22.6	26.6
	SHUA0020	6	9	11	14	18	22	26	32	38	45	53
	SHUA0025	11	16	20	25	31	37	45	55	65	77	91
	SHUA0032	16	23	30	37	46	56	68	82	98	116	137
	SHUA0040	21	29	37	46	58	71	86	103	123	146	172
	SHUA0050	34	49	62	77	95	117	142	171	204	242	285
	SHUA0065	55	78	98	123	153	187	227	273	326	387	457
	SHUA0080	82	116	148	185	229	281	341	410	489	581	685
	SHUA0100	126	179	227	285	353	432	524	631	753	894	1054
	SHUS0125	234	332	422	528	654	802	973	1170	1397	1658	1956
	SHUS0150	337	479	607	761	942	1154	1400	1685	2012	2387	2817
	SHUS0200	500	711	902	1131	1400	1716	2082	2504	2990	3549	4187

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

R717 — **Saturated vapour suction line - MESH STRAINERS**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, ΔT = 0.6K										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Strainers, straight	STRS0015	2.0	2.9	3.7	4.6	5.7	7.0	8.5	10.2	12.2	14.5	17.1
	STRS0020	4	6	8	10	12	15	18	21	25	30	36
	STRS0025	8	12	15	19	24	29	35	42	50	60	70
	STRS0032	14	20	26	32	40	49	59	72	85	101	120
	STRS0040	15	22	28	35	43	52	64	77	92	109	128
	STRS0050	28	39	50	62	77	94	115	138	165	196	231
	STRS0065	34	48	61	76	94	115	140	169	201	239	282
	STRS0080	63	89	113	142	176	215	261	314	376	446	526
	STRS0100	97	138	175	220	272	334	405	487	582	691	815
Strainers, angle	STRA0015	3	4	5	6	7	9	11	13	16	19	22
	STRA0020	6	8	10	13	16	19	23	28	33	40	47
	STRA0025	11	16	20	25	31	38	46	55	66	78	92
	STRA0032	19	27	34	42	52	64	78	94	112	133	156
	STRA0040	20	28	36	45	56	69	83	100	120	142	168
	STRS0050	44	63	80	101	125	153	185	223	266	316	373
	STRS0065	44	62	79	99	123	151	183	220	263	312	368
	STRS0080	82	117	149	186	231	283	343	413	493	585	690
	STRA0100	127	181	229	287	356	436	529	637	760	903	1065

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

Valve selection

Valves for Suction line (continued)

R717 — **Saturated vapour suction line - SOLENOID VALVES, 1-STEP OPENED**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, ΔT = 0.1K										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Solenoid, 1-step opened	SO1P0025	8	11	15	18	23	28	33	40	48	57	67
	SO1P0032	11	15	19	24	30	36	44	53	63	75	89
	SO1P0040	16	22	28	36	44	54	66	79	94	112	132
	SO1P0050	26	37	47	59	73	89	108	130	156	185	218
	SO1P0065	58	82	104	131	162	199	241	290	346	411	485
	SO1P0080	84	119	151	189	234	287	348	419	500	594	700
	SO1P0100	137	195	247	309	383	469	569	685	818	970	1145

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

R717 — **Saturated vapour suction line - SOLENOID VALVES, 2-STEP OPENED**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, ΔT = 0.1K										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Solenoid, 2-step opened	SO2P0025	7	10	13	16	20	24	29	35	42	50	59
	SO2P0032	9	13	17	21	26	32	39	47	56	66	78
	SO2P0040	15	21	27	33	41	51	62	74	88	105	124
	SO2P0050	25	36	46	57	71	87	106	127	152	180	213
	SO2P0065	53	76	96	120	149	182	221	266	317	377	444
	SO2P0080	77	109	139	174	215	264	320	385	460	546	644
	SO2P0100	123	174	221	277	343	421	510	614	733	870	1026

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

The external pilot pressure must be at least 1 bar higher than the inlet pressure.

R717 — **Saturated vapour suction line - SOLENOID VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on n = 5, DN15-20: Δp = 0.05 bar, DN25-40: Δp = 0.07 bar										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Solenoid valves	SODP/PS0015	3.7	4.5	5.1	5.8	6.5	7.3	8.1	9.0	9.9	10.9	12.0
	SODP/PS0020	6	7	8	10	11	12	13	15	16	18	20
	SOPS0025	16	20	22	25	28	32	35	39	43	48	52
	SOPS0032	26	31	36	40	46	51	57	63	69	76	84
	SOPS0040	40	49	56	63	71	80	89	98	108	119	131

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

R717 — **Saturated vapour suction line - PILOT-OPERATED VALVES, 1-FUNCTIONAL**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, Δp = 0.15 bar										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Pilot-operated, 1-function.	PM1P0025	26	32	36	41	46	51	57	63	70	77	84
	PM1P0032	40	49	56	63	71	79	88	98	108	119	130
	PM1P0040	69	83	95	107	121	135	150	167	184	202	222
	PM1P0050	97	117	134	152	171	191	213	235	260	286	314
	PM1P0065	182	221	251	285	321	359	399	442	488	538	591
	PM1P0080	326	395	451	511	575	643	715	792	875	964	1058
	PM1P0100	473	573	653	740	833	932	1037	1149	1268	1396	1534

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

R717 — **Saturated vapour suction line - PILOT-OPERATED VALVES, 3-FUNCTIONAL**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, Δp = 0.15 bar										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Pilot-operated, 3-function.	PM3P0025	26	32	36	41	46	51	57	63	70	77	84
	PM3P0032	40	49	56	63	71	79	88	98	108	119	130
	PM3P0040	69	83	95	107	121	135	150	167	184	202	222
	PM3P0050	97	117	134	152	171	191	213	235	260	286	314
	PM3P0065	182	221	251	285	321	359	399	442	488	538	591
	PM3P0080	326	395	451	511	575	643	715	792	875	964	1058
	PM3P0100	473	573	653	740	833	932	1037	1149	1268	1396	1534

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

Valves for Pumped circulating suction line

R717 **Pumped circulation vapour suction line - SHUT-OFF VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Shut-off valves, straight	SHUS0010	1.0	1.4	1.8	2.2	2.7	3.2	3.8	4.5	5.3	6.2	7.2
	SHUS0015	1.6	2.3	2.8	3.5	4.2	5.1	6.1	7.2	8.4	9.8	11.3
	SHUS0020	3	4	5	7	8	10	12	14	16	19	22
	SHUS0025	5	8	9	12	14	17	20	24	28	33	38
	SHUS0032	8	11	14	17	21	25	30	35	41	48	56
	SHUS0040	10	15	18	22	27	33	39	46	54	63	73
	SHUS0050	20	29	36	44	54	64	77	91	106	124	144
	SHUS0065	32	45	56	69	84	101	120	142	166	194	225
	SHUS0080	50	70	87	108	131	158	188	222	261	304	352
	SHUS0100	89	124	155	191	233	280	334	395	463	540	625
	SHUS0125	155	216	270	333	406	488	582	687	806	939	1088
	SHUS0150	196	275	343	423	515	620	739	873	1024	1193	1382
	SHUS0200	329	461	575	709	863	1038	1237	1462	1715	1998	2315
Shut-off valves, angle	SHUA0010	1.5	2.1	2.6	3.2	3.9	4.7	5.6	6.6	7.7	9.0	10.4
	SHUA0015	2.3	3.2	4.0	5.0	6.0	7.3	8.7	10.2	12.0	14.0	16.2
	SHUA0020	5	6	8	10	12	15	17	20	24	28	32
	SHUA0025	8	11	14	17	21	25	30	35	41	48	56
	SHUA0032	12	17	21	26	31	37	45	53	62	72	83
	SHUA0040	15	21	26	32	39	47	56	66	78	90	105
	SHUA0050	25	35	43	53	65	78	93	110	129	150	174
	SHUA0065	39	55	69	85	104	125	148	175	206	240	278
	SHUA0080	59	83	104	128	155	187	223	263	309	360	417
	SHUA0100	91	128	159	196	239	288	343	405	475	554	641
	SHUS0125	169	237	296	364	444	534	636	751	881	1027	1190
	SHUS0150	243	341	426	525	639	768	916	1082	1269	1479	1713
	SHUS0200	362	507	633	780	949	1142	1361	1608	1886	2198	2546

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

R717 **Pumped circulation vapour suction line - SOLENOID VALVES, 1-STEP OPENED**

Valve	Valve Model	Q_O (kW) at t_O based on n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Solenoid, 1-step opened	SO1P0025	8	12	14	18	22	26	31	37	43	50	58
	SO1P0032	11	15	19	23	28	34	41	48	57	66	76
	SO1P0040	16	23	28	35	42	51	61	72	84	98	113
	SO1P0050	27	37	47	57	70	84	100	118	139	162	187
	SO1P0065	59	83	104	128	155	187	223	263	309	360	417
	SO1P0080	85	120	150	184	224	270	322	380	446	520	602
	SO1P0100	699	979	1223	1507	1834	2207	2629	3106	3644	4247	4919

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

Valves for Pumped circulating suction line (continued)

R717 **Pumped circulation vapour suction line - SOLENOID VALVES, 2-STEP OPENED**

Valve	Valve Model	Q_O (kW) at t_O based on n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Solenoid, 2-step opened	SO2P0025	7	10	13	16	19	23	27	32	38	44	51
	SO2P0032	10	13	17	21	25	30	36	42	50	58	67
	SO2P0040	15	21	26	33	40	48	57	67	79	92	106
	SO2P0050	26	36	45	56	68	82	98	115	135	158	183
	SO2P0065	54	76	95	117	142	171	204	241	283	330	382
	SO2P0080	79	110	138	169	206	248	296	349	410	478	553
	SO2P0100	626	877	1096	1351	1644	1978	2357	2785	3266	3807	4409

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.
The external pilot pressure must be at least 1 bar higher than the inlet pressure.

R717 **Pumped circulation vapour suction line - PILOT-OPERATED VALVES, 1-FUNCTIONAL**

Valve	Valve Model	Q_O (kW) at t_O based on Δp = 0.4 bar, n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Pilot-operated, 1-function.	PM1P0025	11	14	15	17	19	21	22	24	26	29	31
	PM1P0032	18	21	24	26	29	32	35	38	41	44	48
	PM1P0040	30	36	40	45	49	54	59	64	70	75	81
	PM1P0050	42	51	57	63	70	77	84	91	99	107	115
	PM1P0065	80	95	107	119	131	144	157	171	185	200	216
	PM1P0080	143	170	191	213	235	258	282	307	332	359	387
	PM1P0100	1035	1234	1385	1542	1704	1871	2043	2222	2408	2603	2806

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

R717 **Pumped circulation vapour suction line - PILOT-OPERATED VALVES, 3-FUNCTIONAL**

Valve	Valve Model	Q_O (kW) at t_O based on Δp = 0.4 bar, n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Pilot-operated, 3-function.	PM3P0025	11	14	15	17	19	21	22	24	26	29	31
	PM3P0032	18	21	24	26	29	32	35	38	41	44	48
	PM3P0040	30	36	40	45	49	54	59	64	70	75	81
	PM3P0050	42	51	57	63	70	77	84	91	99	107	115
	PM3P0065	80	95	107	119	131	144	157	171	185	200	216
	PM3P0080	143	170	191	213	235	258	282	307	332	359	387
	PM3P0100	1035	1234	1385	1542	1704	1871	2043	2222	2408	2603	2806

The capacities in table are based on circulating rate n = 5. For other recirculating rate, the actual evaporator capacity divide by actual circulating rate and then mutiply by 5. Using this new calculated capacity for selecting the valve.

Valves for HP Discharge line

R717 **Discharge line - SHUT-OFF VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, ΔT = 0.1K										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Shut-off valves, straight	SHUS0010	17	17	17	17	17	17	17	18	18	18	18
	SHUS0015	26	27	27	27	27	27	28	28	28	28	28
	SHUS0020	51	52	52	53	53	53	54	54	54	54	55
	SHUS0025	89	90	91	91	92	92	93	94	94	95	95
	SHUS0032	129	131	132	133	134	135	135	136	137	138	138
	SHUS0040	170	172	174	175	176	177	178	179	180	181	182
	SHUS0050	334	338	340	343	345	348	350	352	354	355	357
	SHUS0065	523	529	533	537	540	544	547	550	553	556	559
	SHUS0080	819	829	835	841	847	852	857	862	867	871	876
	SHUS0100	1456	1472	1483	1493	1504	1514	1523	1532	1540	1548	1555
	SHUS0125	2534	2562	2581	2600	2618	2635	2651	2667	2681	2695	2707
	SHUS0150	3219	3254	3279	3302	3325	3347	3367	3387	3406	3423	3439
	SHUS0200	5391	5451	5492	5531	5570	5606	5641	5674	5704	5733	5760
Shut-off valves, angle	SHUA0010	24	25	25	25	25	25	25	26	26	26	26
	SHUA0015	38	38	38	39	39	39	39	40	40	40	40
	SHUA0020	75	76	77	77	78	78	79	79	80	80	81
	SHUA0025	129	131	132	133	134	135	135	136	137	138	138
	SHUA0032	194	196	198	199	201	202	203	204	205	206	207
	SHUA0040	244	246	248	250	252	253	255	256	258	259	260
	SHUA0050	404	409	412	415	418	420	423	426	428	430	432
	SHUA0065	647	654	659	664	668	673	677	681	685	688	691
	SHUA0080	970	981	989	996	1003	1009	1015	1021	1027	1032	1037
	SHUA0100	1493	1510	1521	1532	1543	1553	1562	1572	1580	1588	1596
	SHUS0125	2771	2802	2823	2843	2863	2881	2899	2916	2932	2947	2961
	SHUS0150	3989	4034	4064	4093	4121	4148	4174	4198	4221	4243	4262
	SHUS0200	5930	5996	6041	6085	6126	6167	6205	6241	6275	6307	6336

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

R717 **Discharge line - PILOT-OPERATED VALVES, 1-FUNCTIONAL**

Valve	Valve Model	Q_O (kW) at t_O based on Δp = 0.2 bar, n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Pilot-operated, 1-function.	PM1P0025	135	136	137	138	139	140	141	142	143	143	144
	PM1P0032	208	211	212	214	215	217	218	219	220	221	223
	PM1P0040	355	359	362	365	367	369	372	374	376	378	380
	PM1P0050	502	508	512	515	519	522	526	529	531	534	537
	PM1P0065	943	954	961	968	975	981	987	993	998	1003	1008
	PM1P0080	1691	1709	1722	1735	1747	1758	1769	1779	1789	1798	1806
	PM1P0100	2450	2477	2496	2514	2531	2548	2564	2579	2593	2606	2618

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

The supplied pressure to the pilot must be at least 1 bar higher than the inlet pressure.

Valve selection

Valves for Discharge line (continued)

R717 **Discharge line - PILOT-OPERATED VALVES, 3-FUNCTIONAL**

Valve	Valve Model	Q_O (kW) at t_O based on Δp = 0.2 bar, n = 5										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Pilot-operated, 3-function.	PM3P0025	135	136	137	138	139	140	141	142	143	143	144
	PM3P0032	208	211	212	214	215	217	218	219	220	221	223
	PM3P0040	355	359	362	365	367	369	372	374	376	378	380
	PM3P0050	502	508	512	515	519	522	526	529	531	534	537
	PM3P0065	943	954	961	968	975	981	987	993	998	1003	1008
	PM3P0080	1691	1709	1722	1735	1747	1758	1769	1779	1789	1798	1806
	PM3P0100	2450	2477	2496	2514	2531	2548	2564	2579	2593	2606	2618

The above capacities are decreased by 4% for every Δt_{superh} = 10K superheat temperature.

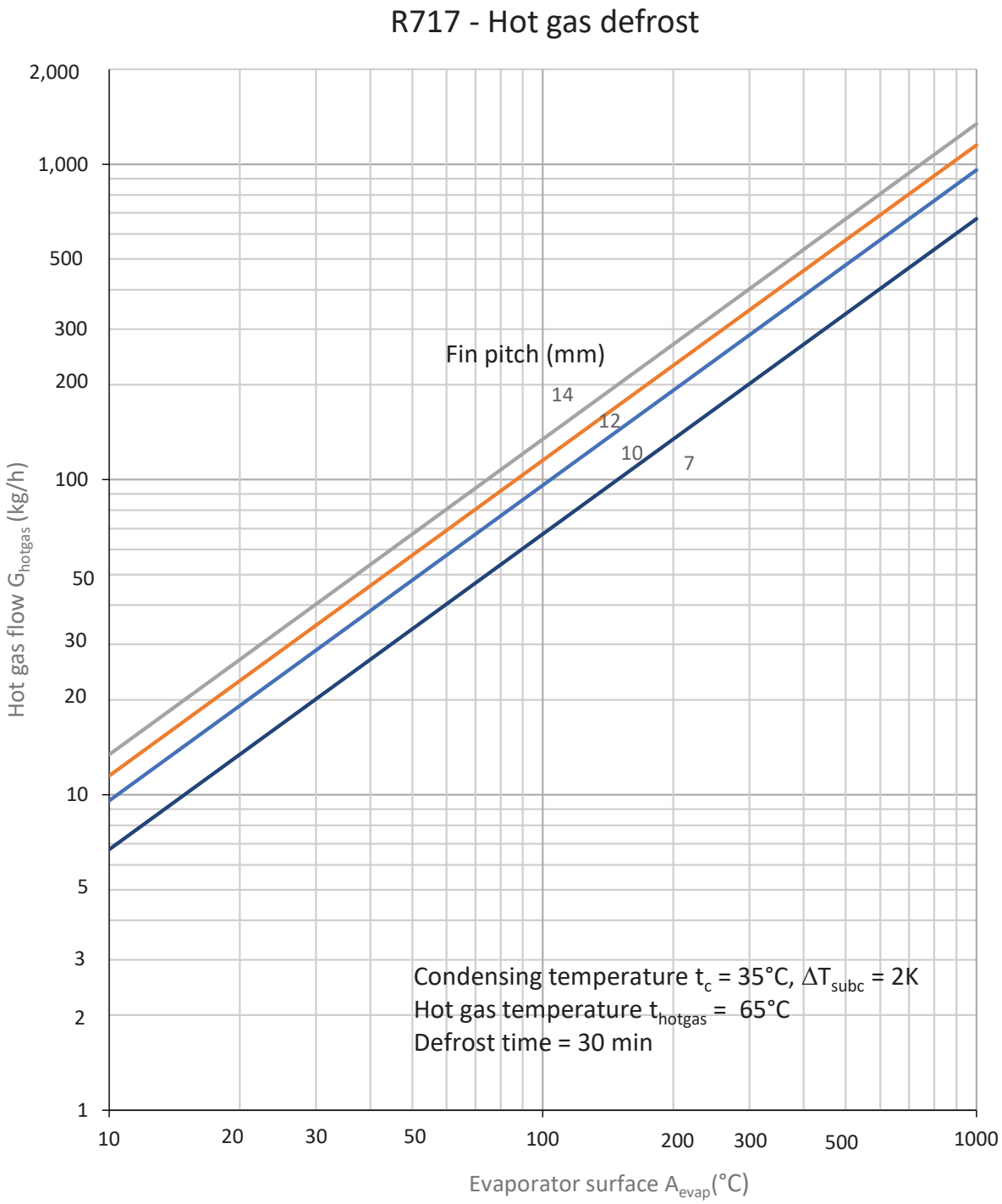
The supplied pressure to the pilot must be at least 1 bar higher than the inlet pressure.

R717 **Discharge line - SHUT-OFF CHECK VALVES**

Valve	Valve Model	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, DN32-40: DT = 0.21K, DN40-150: DT = 0.26K										
		-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
Shut-off check, straight	CHSS0032	155	157	158	159	160	161	162	163	164	165	166
	CHSS0040	163	165	166	167	168	169	170	171	172	173	174
	CHSS0050	234	236	238	240	242	243	245	246	247	249	250
	CHSS0065	338	342	344	347	349	351	353	356	357	359	361
	CHSS0080	676	683	688	693	698	703	707	711	715	719	722
	CHSS0100	1334	1349	1359	1369	1378	1387	1396	1404	1412	1419	1425
	CHSS0125	2140	2163	2180	2195	2211	2225	2239	2252	2264	2276	2286
	CHSS0150	4496	4546	4580	4613	4645	4675	4704	4731	4757	4781	4804
Shut-off check, angle	CHSA0032	178	180	182	183	184	185	186	188	189	190	190
	CHSA0040	232	235	237	238	240	242	243	245	246	247	248
	CHSA0050	381	385	388	391	394	396	399	401	403	405	407
	CHSA0065	606	613	618	622	626	631	634	638	642	645	648
	CHSA0080	866	876	882	889	895	901	906	912	917	921	926
	CHSA0100	1672	1690	1703	1715	1727	1739	1749	1759	1769	1778	1786
	CHSA0125	2599	2628	2647	2666	2685	2702	2719	2735	2750	2764	2777
	CHSA0150	4591	4642	4677	4711	4743	4774	4804	4832	4858	4883	4905

Valve selection

Valves for Hot gas line



SHUA0015	153	STRA0015	105		
SHUA0020	305	STRA0020	219		
SHUA0025	523	STRA0025	431		
SHUA0032	784	STRA0032	733		

Correction fators for other condensing temperature

Condensing temperature t_C(°C)					
20	30	35	40	45	50
0.84	0.95	1.00	1.05	1.11	1.17

Valve selection

Valve stations GR4V, GR6V

R717 — **HP liquid line - GR4V1, GR6V1, GR6V3, GR6V5 with expansion function**

Valve size	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K										
	-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
DN15	497	497	496	493	489	482	474	462	447	429	405
DN20	559	559	557	554	550	542	533	520	503	482	455
DN25	2317	2317	2311	2299	2279	2249	2209	2156	2086	1998	1886
DN32	2511	2512	2506	2492	2470	2439	2395	2337	2262	2166	2045

R717 — **HP liquid line - GR4V3, GR4V4, GR4V6**

Valve size	Q_O (kW) at t_O based on t_C = 35°C, Δt_{subc} = 2K, ΔT = 0.03K										
	-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
DN15	35	35	35	36	36	36	36	36	37	37	37
DN20	63	63	64	64	65	65	66	66	66	67	67
DN25	132	133	134	135	136	137	138	139	139	140	141
DN32	204	207	208	210	211	212	214	215	216	217	218
DN40	249	252	254	256	258	259	261	262	264	265	266

R717 — **Pumped recirculating line - GR4V2, GR6V2, GR6V4 GR6V6 with regulation function**

Valve size	Q_O (kW) at t_O based on n = 5										
	-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
DN15	21	25	27	30	32	25	27	28	30	32	34
DN20	30	34	38	41	45	34	37	39	42	44	47
DN25	83	96	106	116	125	96	103	110	117	124	130
DN32	109	127	140	152	165	127	136	145	154	163	172

R717 — **Pumped recirculating line - GR4V5**

Valve size	Q_O (kW) at t_O based on n = 5										
	-47°C	-40°C	-35°C	-30°C	-25°C	-20°C	-15°C	-10°C	-5°C	0°C	5°C
DN15	26	30	33	36	39	30	33	35	37	39	41
DN20	48	56	62	68	73	56	60	64	68	72	76
DN25	100	116	127	139	151	116	124	132	141	149	157
DN32	160	186	205	224	242	186	200	213	226	240	252
DN40	206	240	264	288	312	240	257	274	291	308	325

R717 PIPING STANDARD

Ammonia piping - carbon steel pipe - should conform to ASME Standard B31.5, and to IIAR Standard 2, which states the following:

1. Liquid lines:
- DN40 and smaller: Schedule 80.
- DN50 to DN150: Schedule 40
- DN200 to DN300: Schedule 20.

2. Vapor lines:
- DN150 smaller: Schedule 40
- DN200 to DN300: Schedule 20
- DN350 and larger: Schedule 10.

3. All threaded pipe shall be Schedule 80.

4. Carbon steel pipe shall be ASTM Standard A53 Grade A or B.

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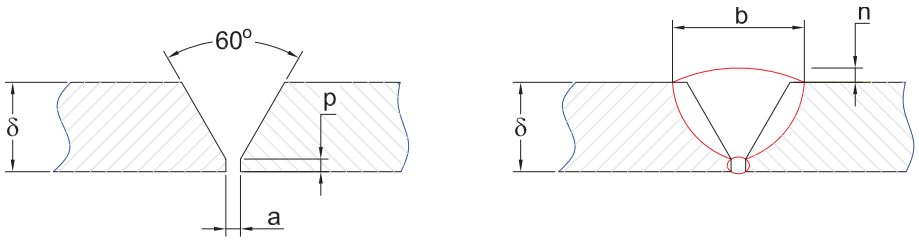
DIMENSION AND MASS OF CARBON STEEL PIPE

Nominal dia.		Outside dia. mm	Schedule 20		Schedule 40		Schedule 60		Schedule 80	
DN	NPS		Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m	Wall thick mm	Unit mass kg/m
10	3/8	17.3			2.3	0.851	2.8	1	3.2	1.11
15	1/2	21.7			2.8	1.31	3.2	1.46	3.7	1.64
20	3/4	27.2			2.9	1.74	3.4	2	3.9	2.24
25	1	34			3.4	2.57	3.9	2.89	4.5	3.27
32	1 1/4	42.7			3.6	3.47	4.5	4.24	4.9	4.57
40	1 1/2	48.6			3.7	4.1	4.5	4.89	5.1	5.47
50	2	60.5	3.2	4.52	3.9	5.44	4.9	6.72	5.5	7.46
65	2 1/2	76.3	4.5	7.97	5.2	9.12	6	10.4	7	12
80	3	89.1	4.5	9.39	5.5	11.3	6.6	13.4	7.6	15.3
90	3 1/2	101.6	4.5	10.8	5.7	13.5	7	16.3	8.1	18.7
100	4	114.3	4.9	13.2	6	16	7.1	18.8	8.6	22.4
125	5	139.8	5.1	16.9	6.6	21.7	8.1	26.3	9.5	30.5
150	6	165.2	5.5	21.7	7.1	27.7	9.3	35.8	11	41.8
200	8	216.3	6.4	33.1	8.2	42.1	10.3	52.3	12.7	63.8

Addendum 2: piping

BUTT WELD JOINT



δ	a	p	b	h
3	1	1	8	1
4	1	1	8	1
5	1	1	10	1
6	1	1	10	1
7	2	2	12	2
8	2	2	14	2
9	2	2	14	2
10	2	2	16	2
12	2	2	18	2
14	2	2	20	2
16	2	2	22	2

INSULATION THICKNESS OF REFRIGERATION PIPES

Pipe size	Inside temperature of pipe						
	-46°C	-40°C	-33°C	-25°C	-15°C	-2°C	2°C
DN10	70	65	60	55	45	35	35
DN15	70	70	60	55	50	40	35
DN20	75	70	65	60	50	40	35
DN25	80	75	70	60	55	40	40
DN32	85	80	75	65	55	45	40
DN40	85	80	75	65	60	45	40
DN50	90	85	80	70	60	45	40
DN65	95	90	80	75	65	50	45
DN80	100	95	85	75	65	50	45
DN100	105	100	90	80	70	55	45
DN125	105	100	95	85	70	55	50
DN150	110	105	95	85	75	55	50
DN200	115	110	100	90	75	60	50
DN250	120	115	105	95	80	60	55
DN300	125	120	105	95	80	60	55

Insulation conditions:

- Stationary air: 20°C - 37°C 90%RH
- Insulation conditions: PU λ_{pu} = 0.024W/m.K
- Steel pipe: λ_{th} = 5W/m.K

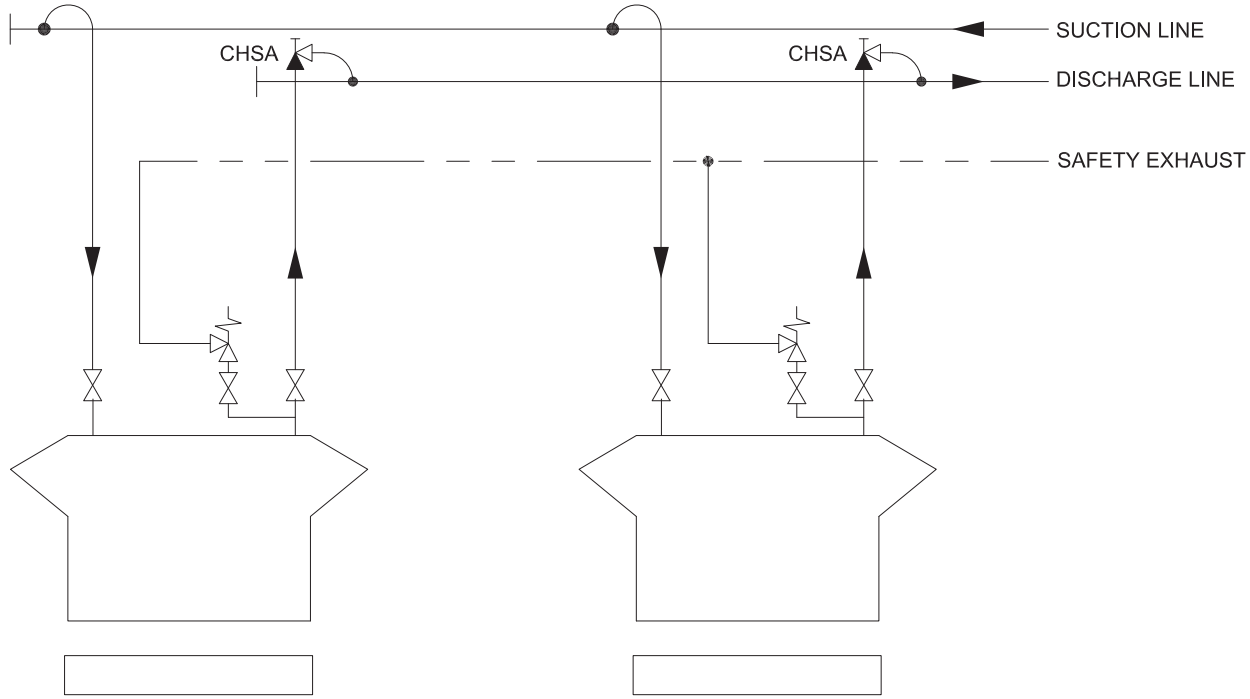
Addendum 3: piping

KÝ HIỆU VAN LẠNH — *LEGEND OF REFRIGERATION VALVES*

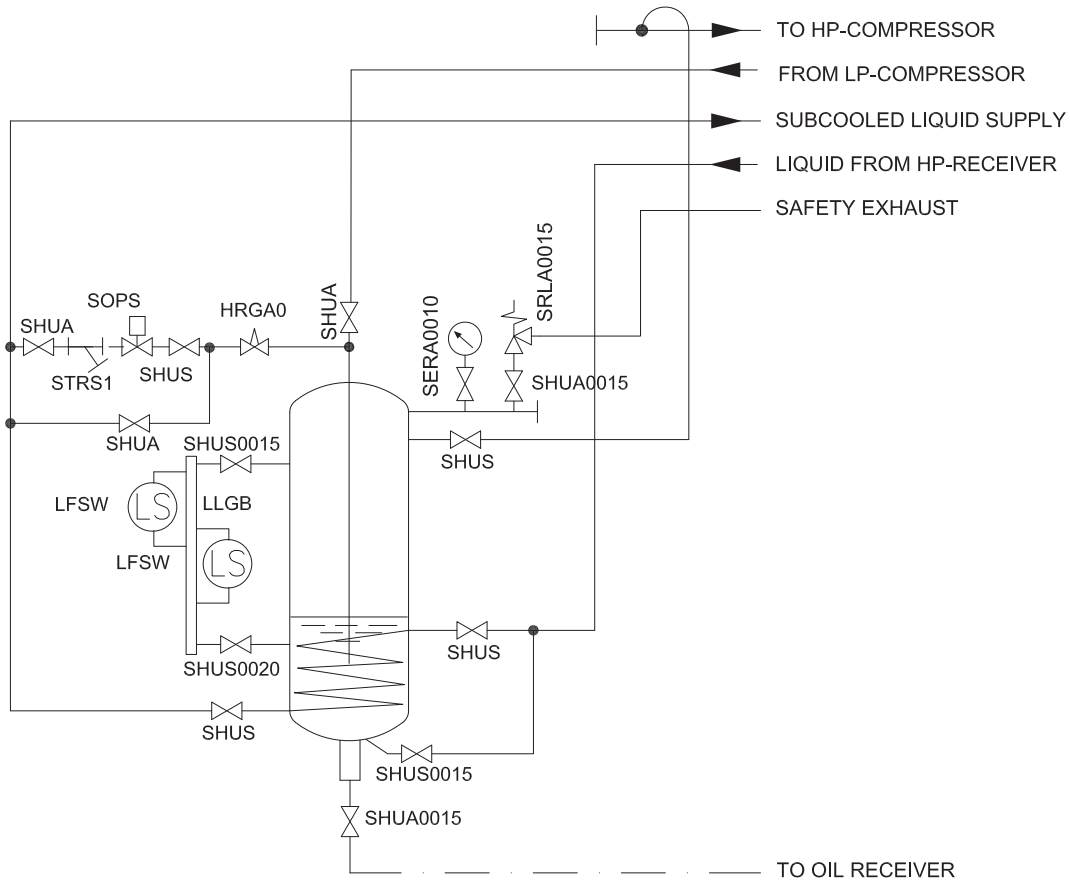
	LOẠI VAN - VALVES	HP VALVES
	SHUT-OFF/STOP VALVE, GENERAL	**SHU**
	STOP VALVE, ANGLE	**SHUA SERA ODRA HDRA**
	STOP VALVE	**SHUS**
	STOP VALVE, ANGLE	**SHUA**
	CHECK VALVE (RIGHT TO LEFT)	**CHKS**
	CHECK VALVE, ANGLE	**CHKA**
	STOP & CHECK VALVE, GENERAL	**CHSS**
	STOP & CHECK VALVE, ANGLE	**CHSA**
	HAND EXPANSION / REGULATING VALVE	**HRGA HRGS**
	STRAINER	**STRA STRS**
	OVERFLOW VALVE	**DPRL**
	CONSTANT PRESSURE REGULATOR	**PMV1 + PLOT1024**
	3-WAY VALVE / DOUBLE STOP VALVE	**TWAY**
	LIQUID LEVEL SWITCH	**LFSW LFSE**
	SAFETY VALVE	**SRLA**
	LIQUID LEVEL SIGHT GLASS	**LLGB LLGV LLGS**
	SOLENOID VALVE	**SOPS SODP**
	SOLENOID VALVE, 1-STEP OPENED	**SO1P**
	SOLENOID VALVE, 2-STEP OPENED	**SO2P**
	PILOT-OPERATED VALVE	**PM1P PM3P**
	VALVE STATION (4 PORTS)	**GR4V**
	VALVE STATION (6 PORTS)	**GR6V**
	ELECTRONIC EXPANSION VALVE	
	THERMOSTATIC EXPANSION VALVE	
	SIGHT GLASS	
	FILTER DRIER	
	FILTER DRIER, INTERCHANGEABLE CORE	
	PRESSUR GAUGE	
	THERMOSTAT	
	(WATER) FLOW SWITCH	
	DIFFERENCIAL PRESSURE SWITCH	
	HIGH PRESSURE SWITCH	
	LOW PRESSURE SWITCH	
	OIL PRESSURE SWITCH	
	FLEXIBLE CONNECTOR	

Addendum 4: typical diagram

Reciprocating compressors in parallel

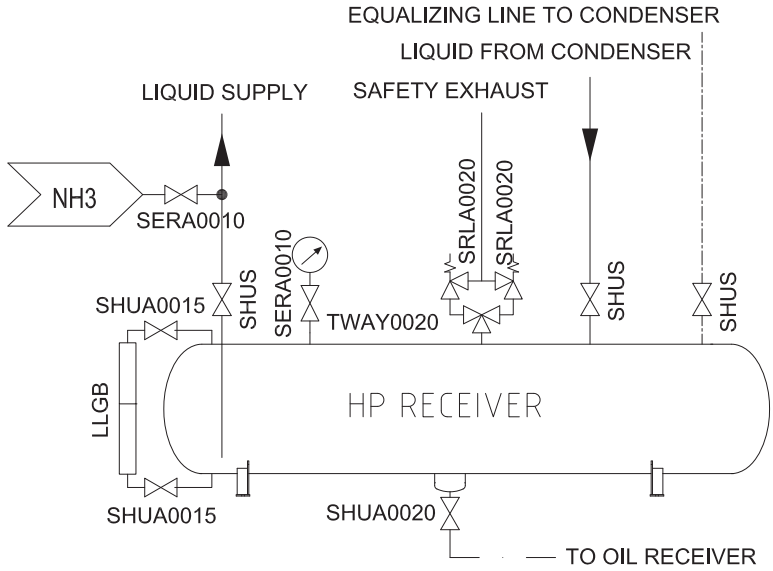


Closed flash interstage cooling receiver type C

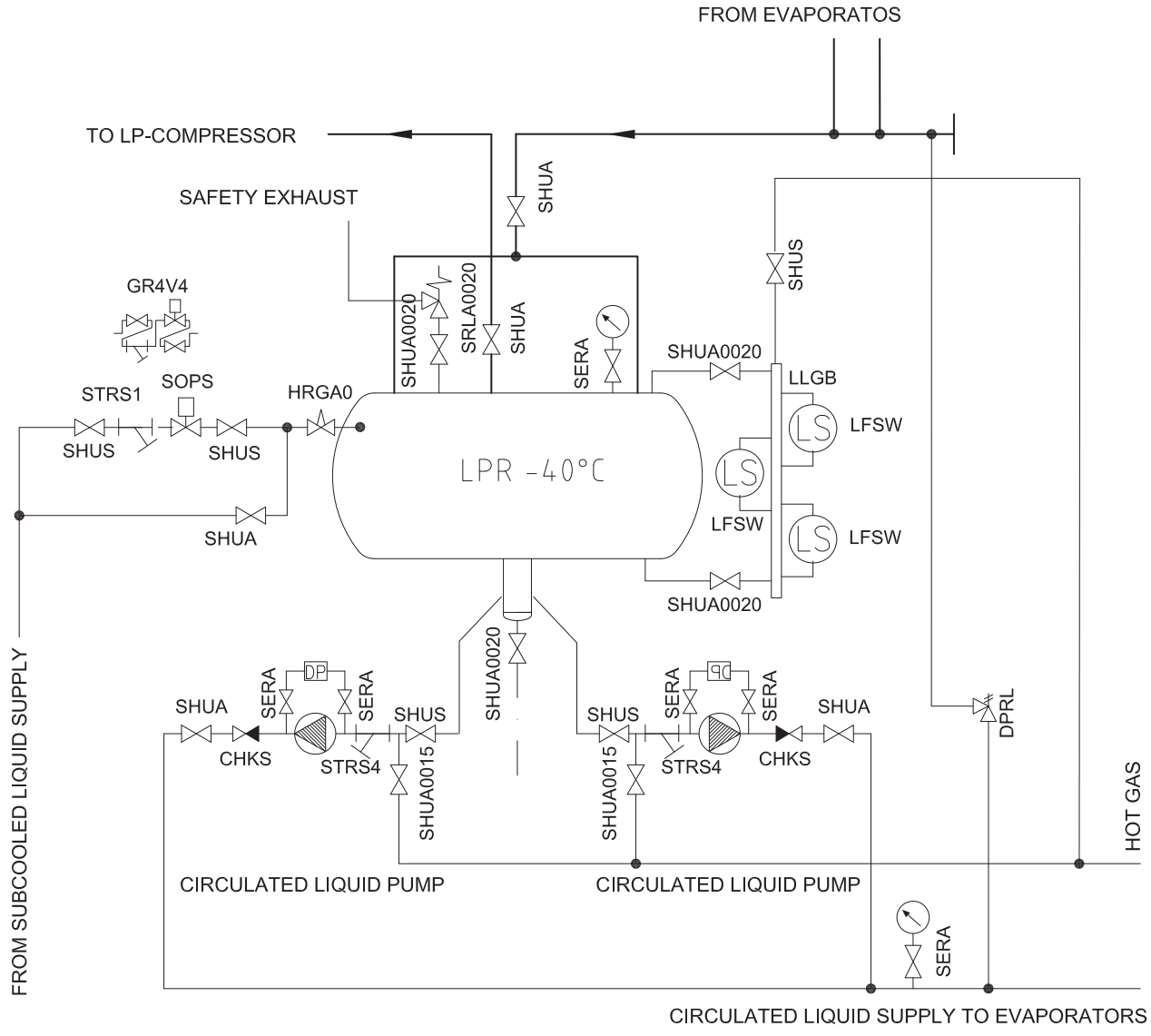


Addendum 5: typical diagram

HP-receiver

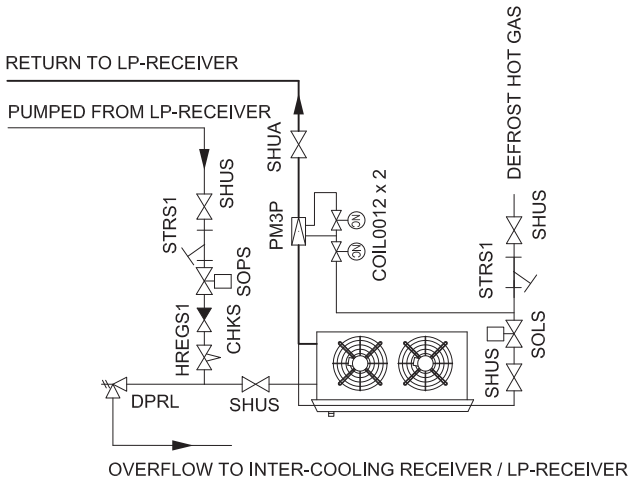


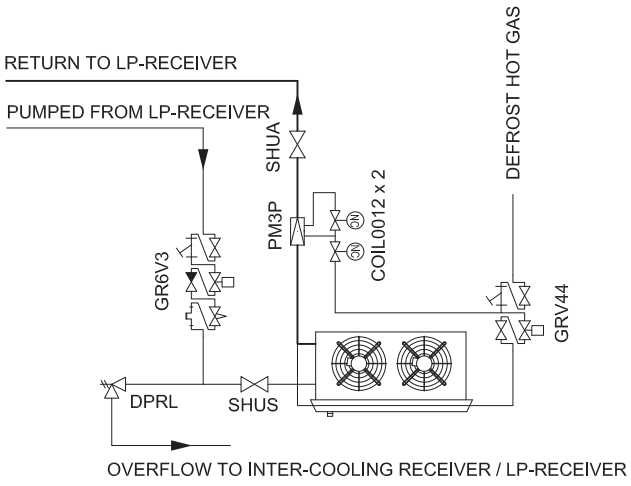
Liquid pump circulated LP-receiver

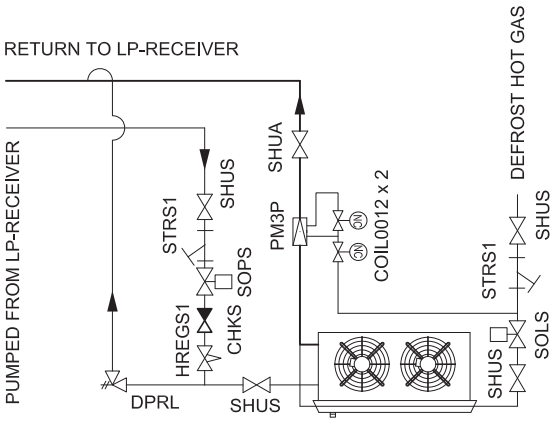


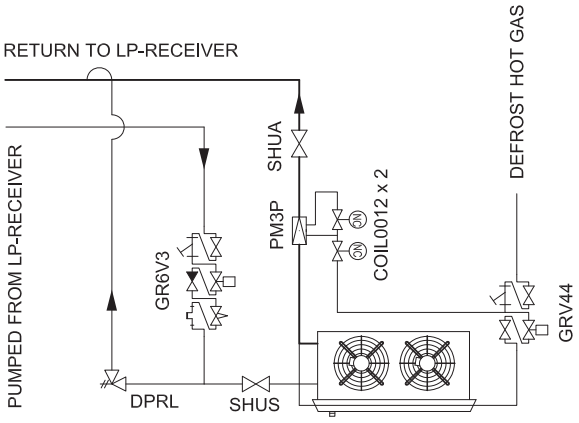
Addendum 6: typical diagram

Hot gas defrost for pump circulated evaporator

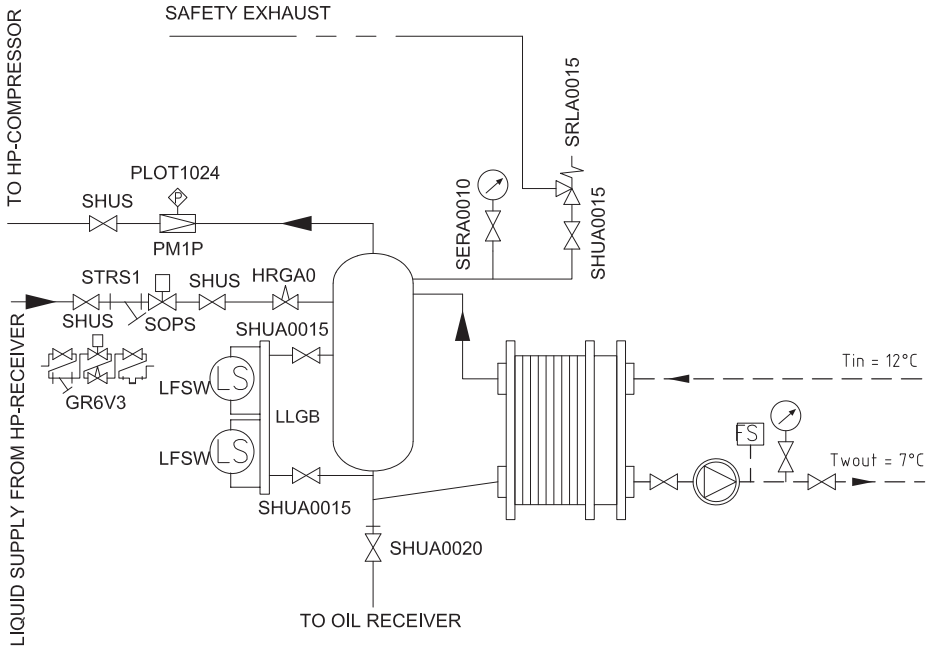






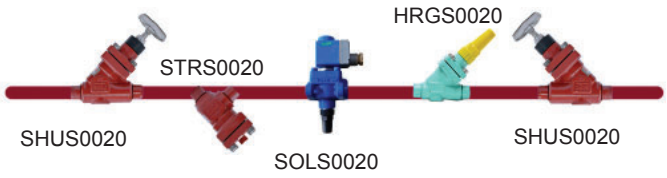


Water chiller

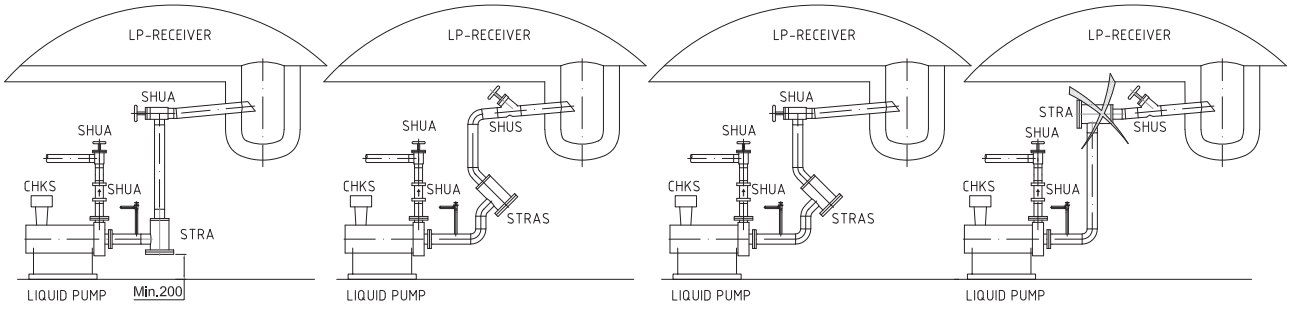


Phụ lục 7: sơ đồ tiêu biểu — Addendum 7: typical diagram

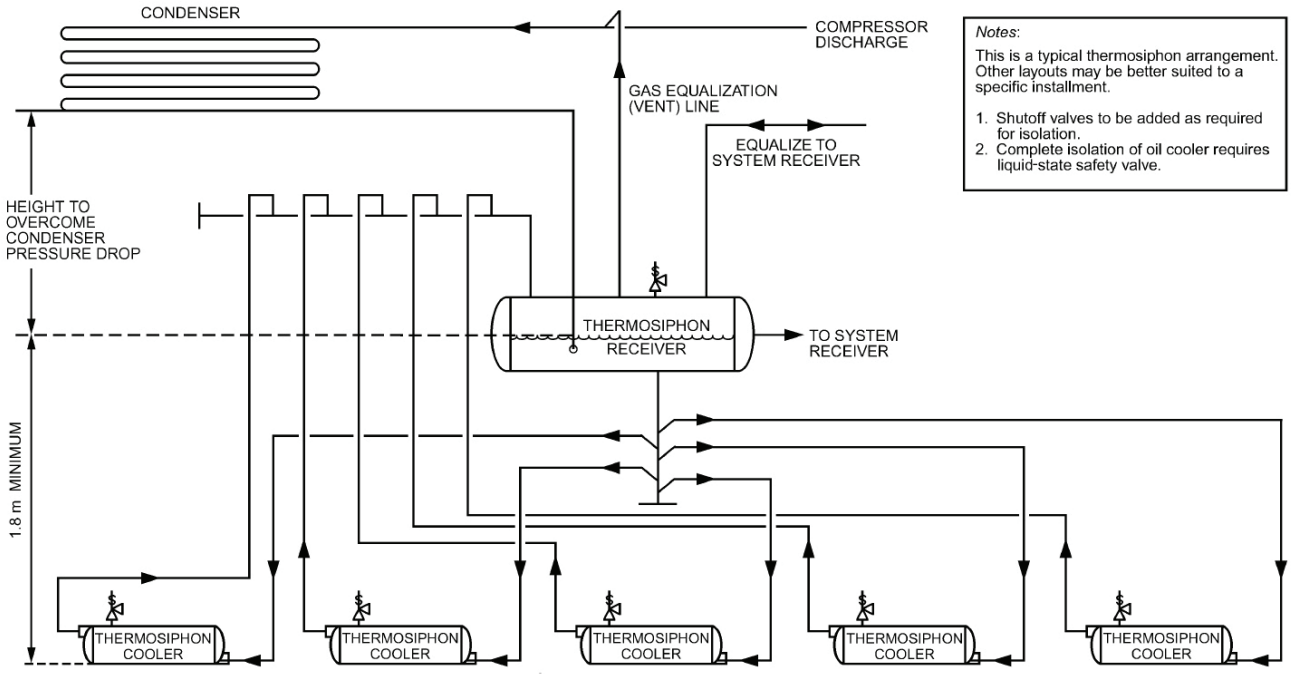
Expansion valve group



Pump for liquid circulation from LP-receiver



Piping for thermosyphon oil cooling



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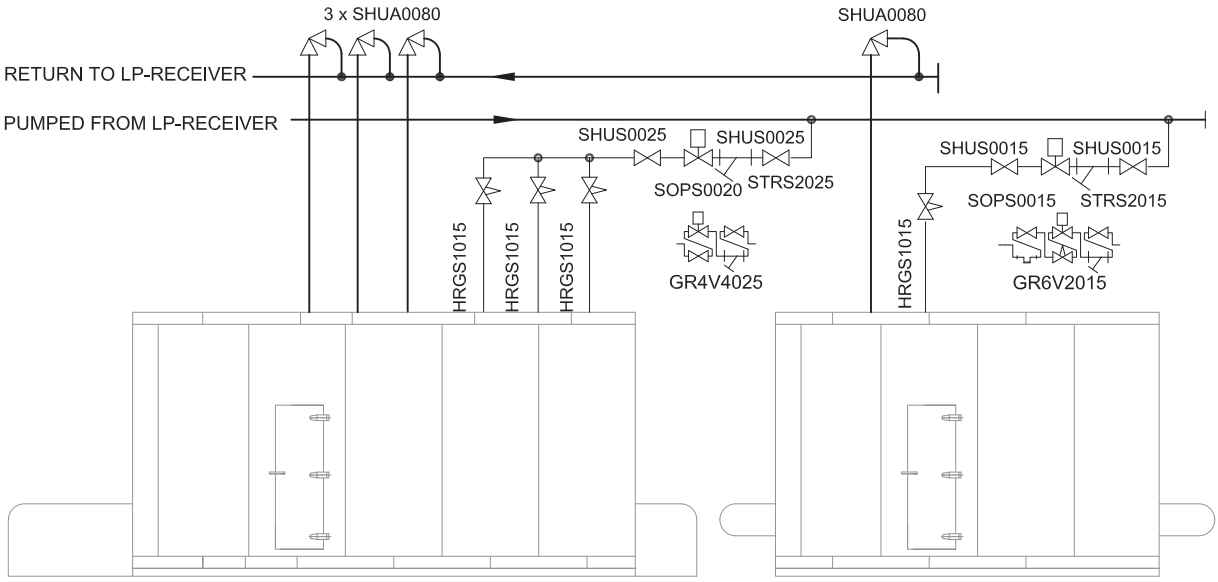
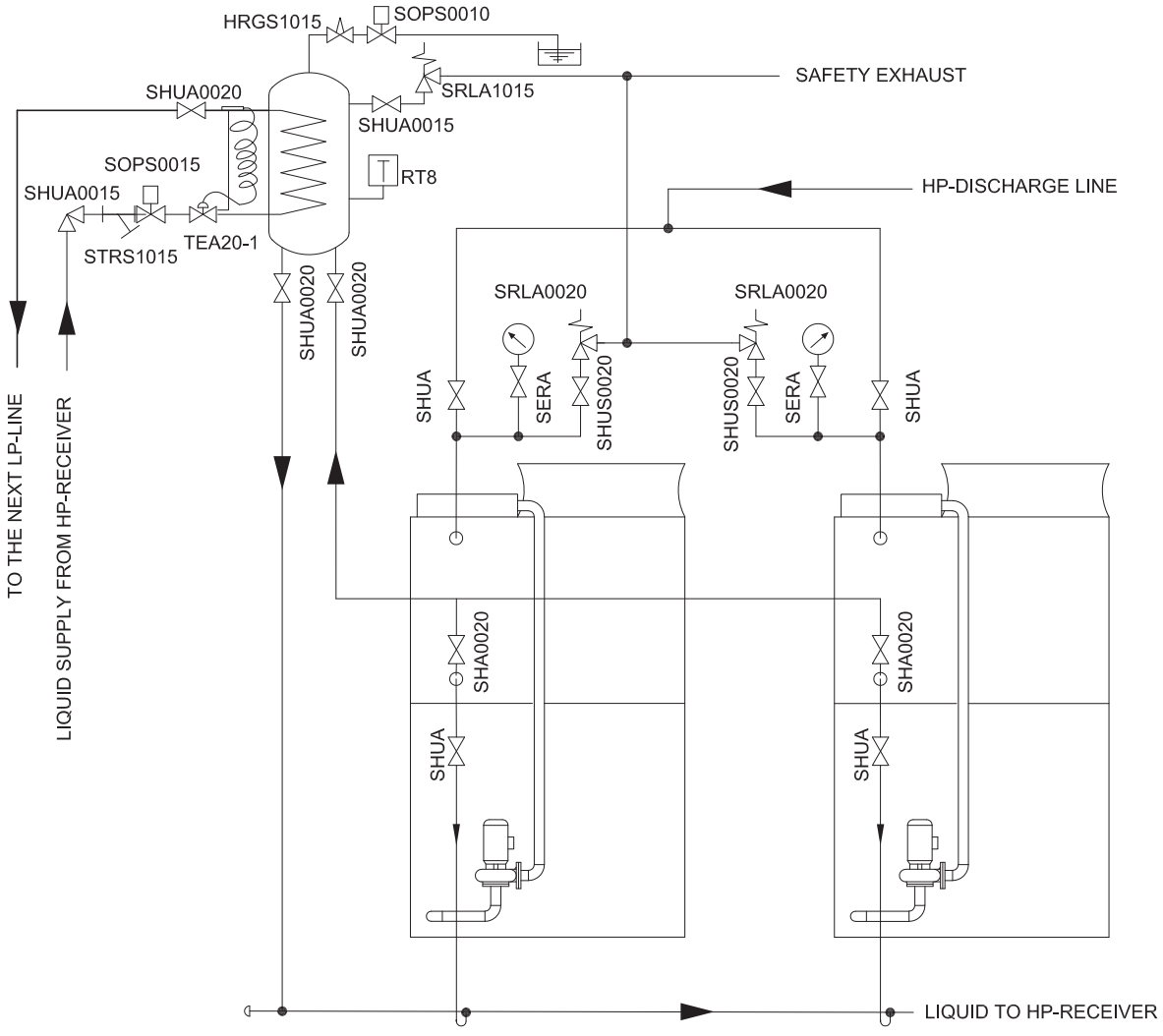
Addendum 8: typical diagram

Pump recirculated IQF & REF



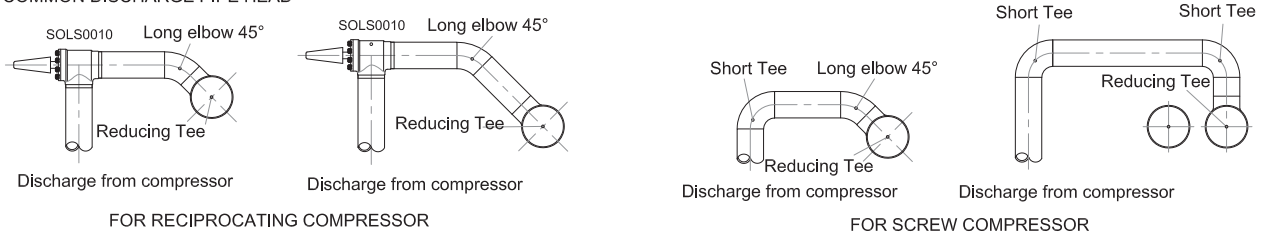
Evaporative condensers & air purger



Addendum 9: typical diagram

Common head pipe in refrigeration piping

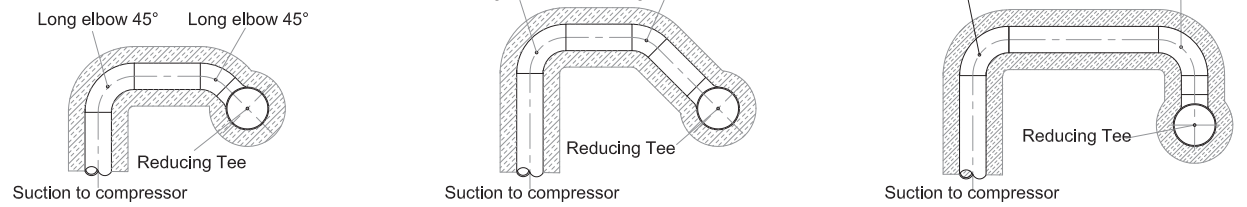
COMMON DISCHARGE PIPE HEAD



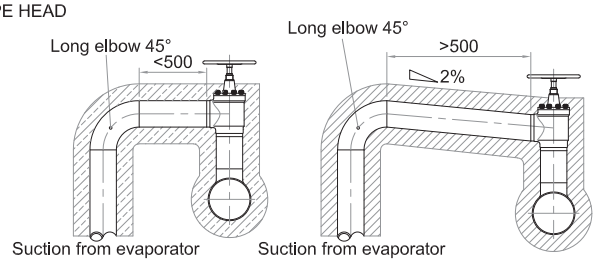
FOR RECIPROCATING COMPRESSOR

FOR SCREW COMPRESSOR

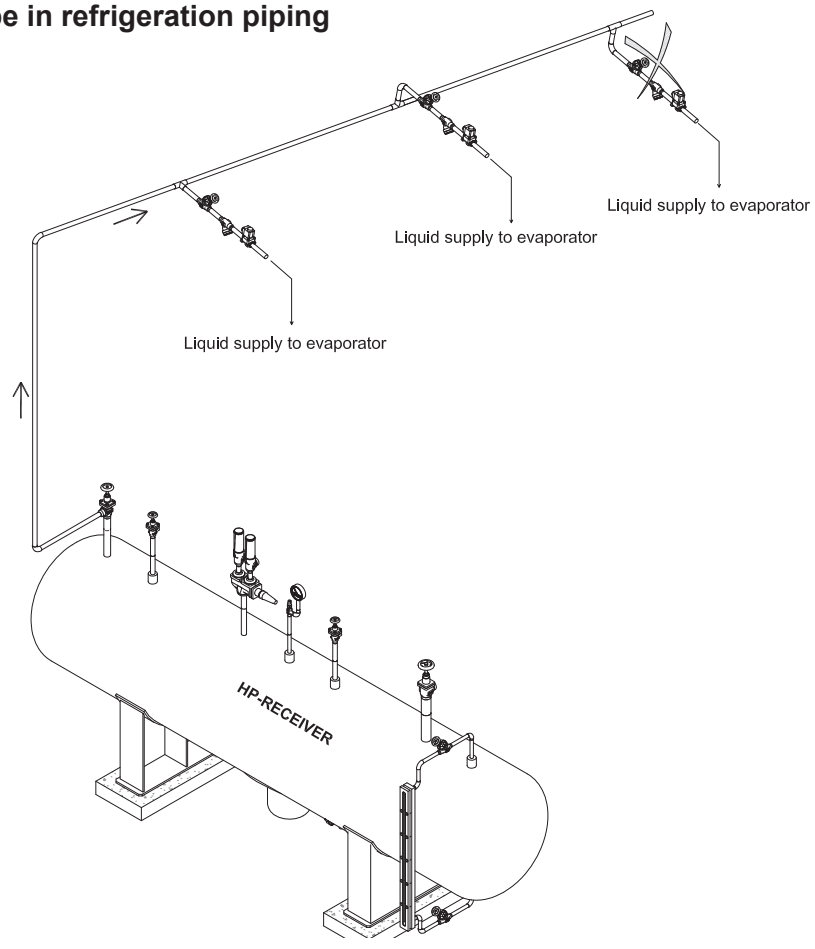
COMMON SUCTION PIPE HEAD



COMMON SUCTION RETURN PIPE HEAD

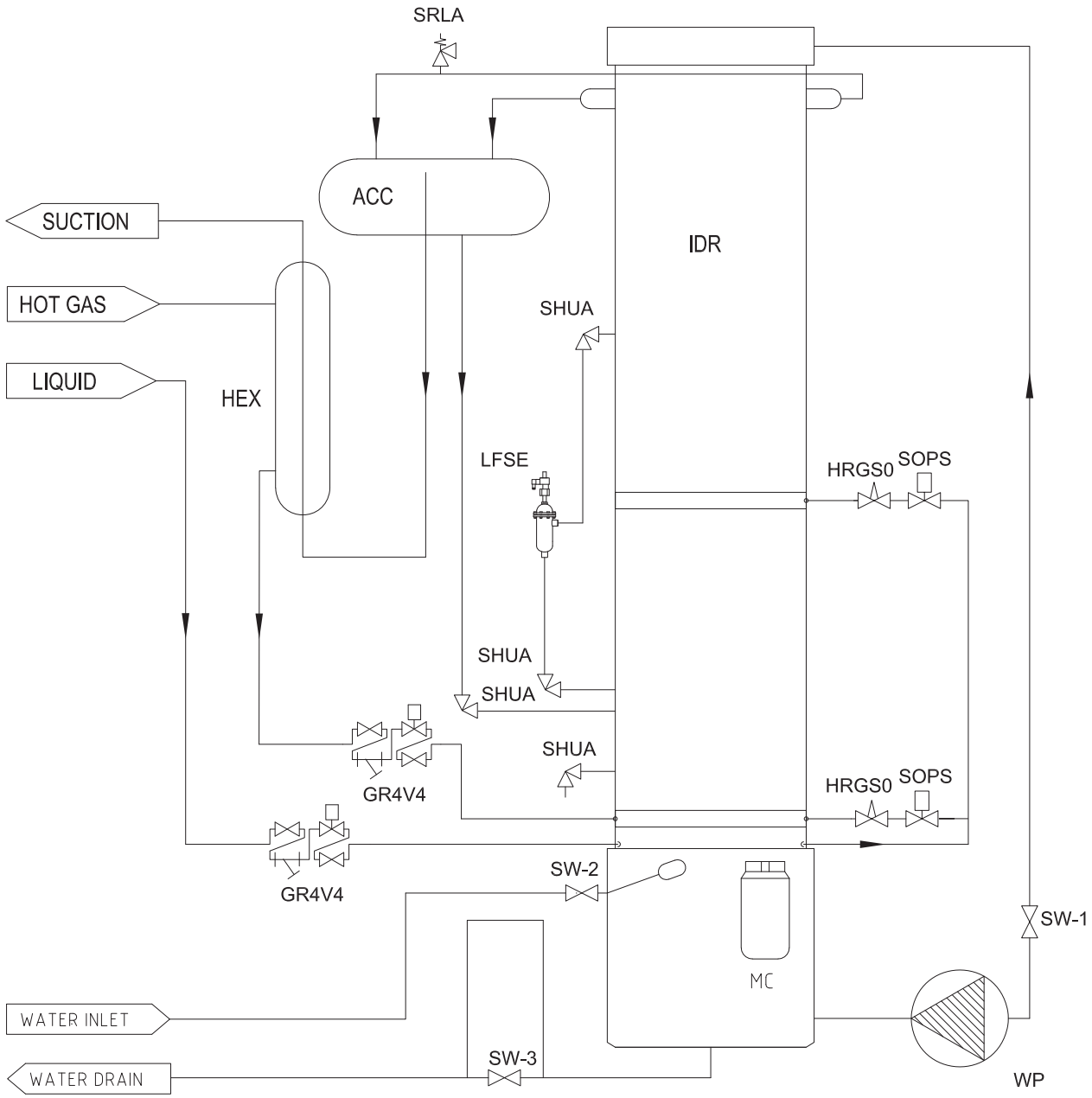


Liquid supply pipe in refrigeration piping



Addendum 10: typical diagram

Ice tube machine - Low side



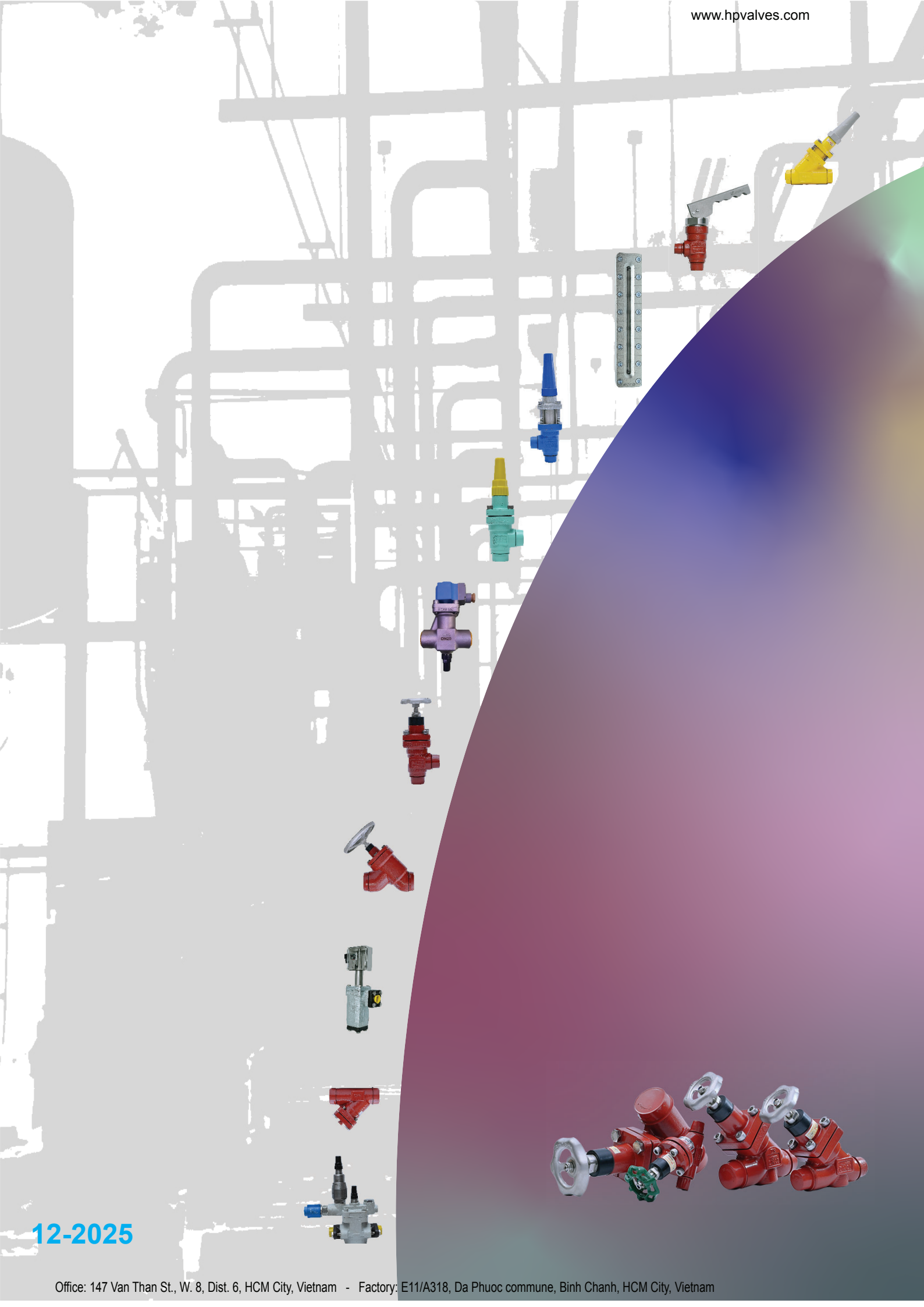
Addendum 11: Ammonia table

R717 ASHRAE-2005.ISO Fundamental

t(oC)	p(bar)	Liquid		Vapour	Liquid	Vapour
		v'(dm^3/kg)	ρ'(kg/m^3)	v"(dm^3/kg)	h'(kJ/kg)	h"(kJ/kg)
-50.00	0.41	1.4243	702.1	2627.7	–24.73	1391.19
-40.00	0.72	1.4489	690.2	1553.3	19.17	1407.76
-38.00	0.80	1.4541	687.7	1406.8	28.01	1410.96
-36.00	0.88	1.4592	685.3	1276.5	36.88	1414.11
-34.00	0.98	1.4646	682.8	1160.4	45.77	1417.23
-33.33	1.01	1.4663	682.0	1124.2	48.76	1418.26
-32.00	1.08	1.4699	680.3	1056.7	54.67	1420.29
-30.00	1.19	1.4754	677.8	964.0	63.60	1423.31
-28.00	1.32	1.4808	675.3	880.8	72.55	1426.28
-26.00	1.45	1.4863	672.8	806.1	81.52	1429.21
-24.00	1.59	1.4919	670.3	739.0	90.51	1432.08
-22.00	1.74	1.4977	667.7	678.4	99.52	1434.91
-20.00	1.90	1.5035	665.1	623.7	108.55	1437.68
-18.00	2.08	1.5092	662.6	574.3	117.60	1440.39
-16.00	2.26	1.5152	660.0	529.5	126.67	1443.06
-14.00	2.46	1.5214	657.3	488.9	135.76	1445.66
-12.00	2.68	1.5274	654.7	451.9	144.88	1448.21
-10.00	2.91	1.5335	652.1	418.3	154.01	1450.70
-8.00	3.15	1.5399	649.4	387.7	163.16	1453.14
-6.00	3.41	1.5463	646.7	359.7	172.34	1455.51
-4.00	3.69	1.5528	644.0	334.1	181.54	1457.81
-2.00	3.98	1.5593	641.3	310.7	190.76	1460.06
0.00	4.29	1.5659	638.6	289.3	200.00	1462.24
2.00	4.62	1.5728	635.8	269.6	209.27	1464.35
4.00	4.97	1.5795	633.1	251.5	218.55	1466.40
6.00	5.35	1.5865	630.3	234.9	227.87	1468.37
8.00	5.74	1.5936	627.5	219.6	237.20	1470.28
10.00	6.15	1.6010	624.6	205.4	246.57	1472.11
12.00	6.59	1.6082	621.8	192.4	255.95	1473.88
14.00	7.05	1.6158	618.9	180.3	265.37	1475.56
16.00	7.53	1.6234	616.0	169.1	274.81	1477.17
18.00	8.04	1.6311	613.1	158.8	284.28	1478.70
20.00	8.57	1.6388	610.2	149.2	293.78	1480.16
22.00	9.14	1.6469	607.2	140.3	303.31	1481.53
24.00	9.73	1.6548	604.3	132.0	312.87	1482.82
26.00	10.35	1.6631	601.3	124.3	322.47	1484.02
28.00	10.99	1.6717	598.2	117.1	332.09	1485.14
30.00	11.67	1.6801	595.2	110.5	341.76	1486.17
32.00	12.38	1.6889	592.1	104.2	351.45	1487.11
34.00	13.12	1.6978	589.0	98.4	361.19	1487.95
36.00	13.90	1.7071	585.8	93.0	370.96	1488.70
38.00	14.71	1.7164	582.6	87.9	380.78	1489.36
40.00	15.55	1.7259	579.4	83.1	390.64	1489.91
42.00	16.44	1.7355	576.2	78.6	400.54	1490.36
44.00	17.35	1.7455	572.9	74.5	410.48	1490.70
46.00	18.31	1.7556	569.6	70.5	420.48	1490.94
48.00	19.31	1.7658	566.3	66.8	430.52	1491.06
50.00	20.34	1.7765	562.9	63.4	440.62	1491.07
55.00	23.11	1.8044	554.2	55.5	466.10	1490.57
60.00	26.16	1.8342	545.2	48.8	491.97	1489.27

HP - valves®

TQK Design



12-2025

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